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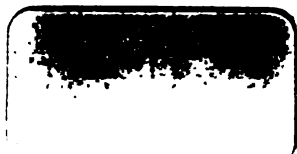


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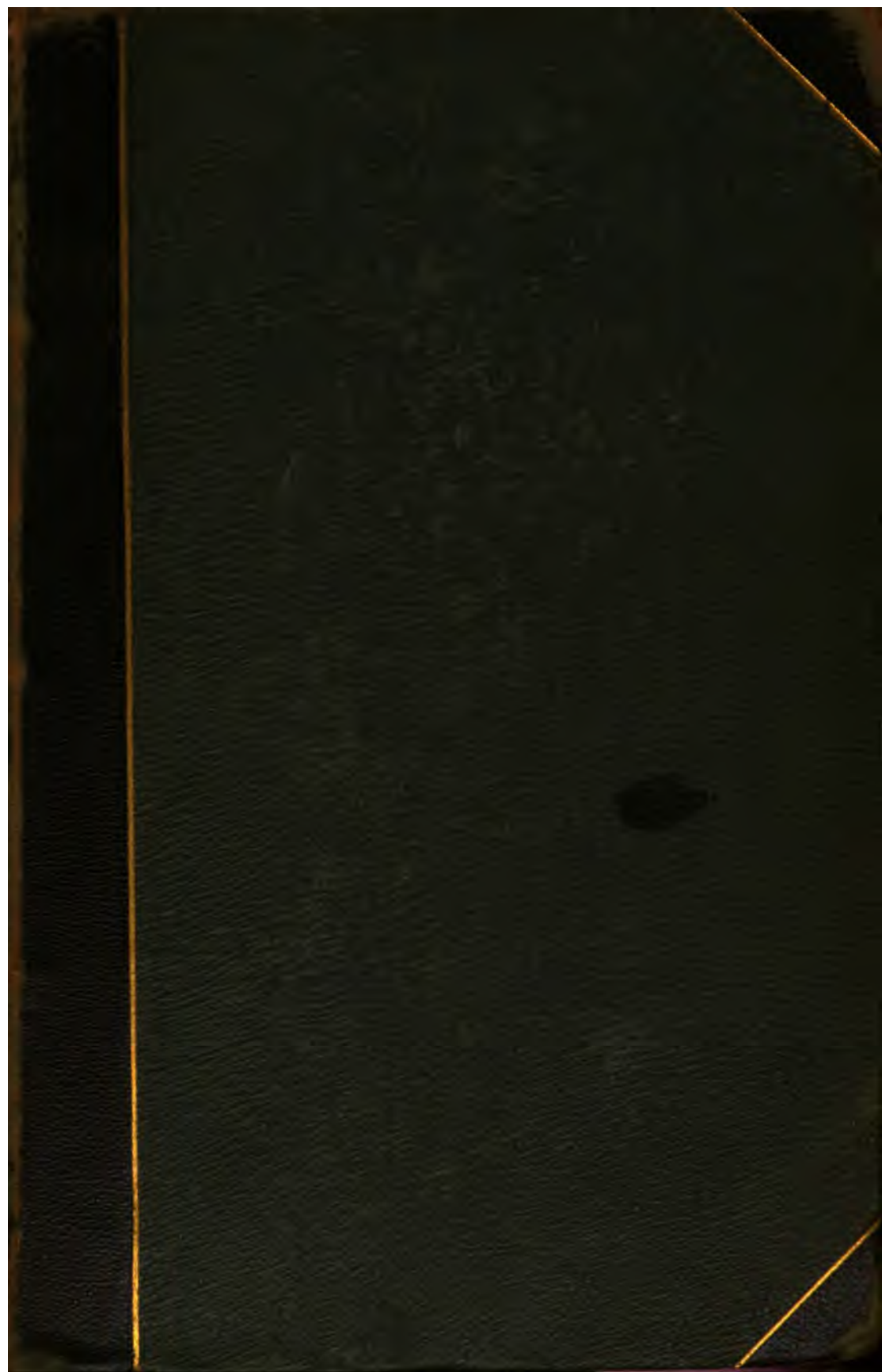
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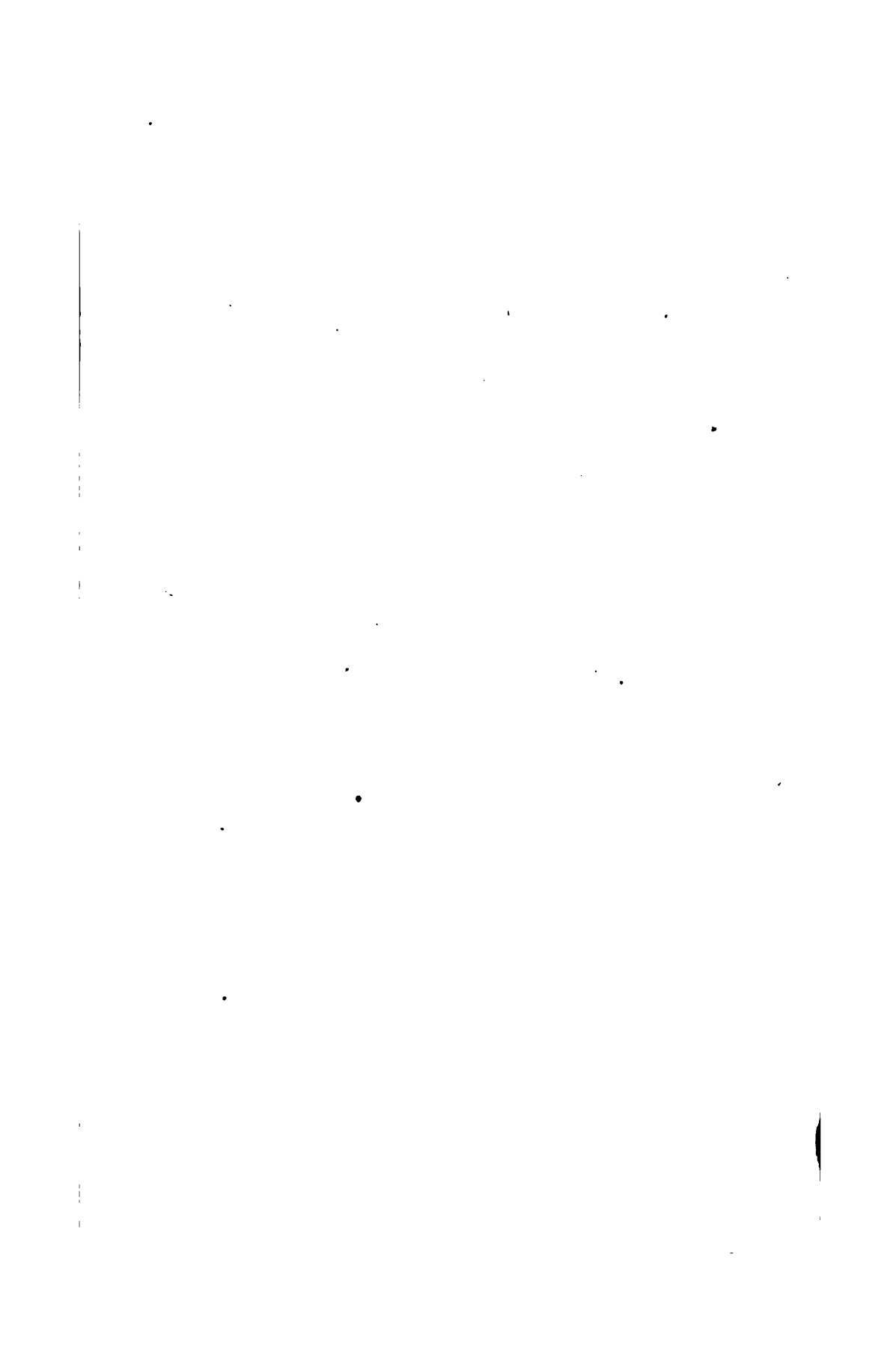
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ARTICLE I.

Address, delivered before the American Society of Dental Surgeons, at the opening of its Fourth Annual Meeting;—Baltimore, July 18th, 1843. By CHAPIN A. HARRIS, M. D., D. D. S., &c. &c. &c.

*Mr. President and Gentlemen
of the American Society of Dental Surgeons:—*

THE welcome return of our anniversary meeting, the fourth of this Association, calling together so many talented and influential members of the profession, for the purpose of devising ways and means to advance the interests of an important branch of the curative art as well as the public good, is an occasion of grateful joy and hearty congratulation. From widely separated sections of the country, from our various fields of labour, usefulness and profit, with spared lives and obligations, a thousand-fold increased, of gratitude to the great Supreme Preserver, we meet to promote the great cause of humanity, by strengthening each others' hands and accomplishing ourselves more perfectly in an art and science so intimately connected with the functions of health in the human system, with the enjoyment of life and the perfection of beauty, as are the operations of Dental Surgery in ameliorating the sufferings and increasing the happiness of man. There is a pleasure as well as a grandeur in contemplating these annual re-unions of members of a time-honoured and useful profession, coming together as to a mighty shrine, before which to renew the truthful

vows of deep devotion to the great cause of human good,—and upon whose altar to lay the offerings of study, research and experience. In this annual action there is analogy to the arterial and venous circulation of the blood of the human system; thrown from the central ganglion, it rushes through the canals of the arteries, then into the veins, perambulating the extremities of the body, taking in the needful supply of oxygen from contact with the air in the lungs or near the surfaces—then returning to leave its richness in the great treasury of life, to deposite all its acquired energy at the central seat of vitality; so, at stated periods, the members of this Society come from their posts of observation to report progress at the centre, to throw their discoveries, improvements, the results of industry, research and experience into the common fund—the great joint stock of dental knowledge. And, it is a subject of sincere, fervent congratulation that, so far as we have information, no member of this association has, during the past year, been called from this scene of his earthly labours. All yet live to assuage the bitterness of human infirmity, to illustrate the triumphs of art over disease, and to remedy the imperfections of even nature itself.

In all great movements, either in religion, politics, science or benevolence, the American character and the popular genius of all our institutions immediately direct us to lay hold of the great principle of voluntary association, as an agent of stronger moral power than any known in the country, to effect any desirable good. We have no wealthy and powerful privileged orders to command any given amelioration or improvement, and hence we combine the power of popular number and bring it to bear upon the objects we desire to accomplish. This national peculiarity accounts for the numerous benevolent and scientific associations found in the United States, before the moral power of which, vice, ignorance, empiricism, bigotry, oppression, and long established habits and modes of thinking are fleeing away like mists of morning before the rising sun. This will furnish the reason why America can boast of the first society of Dental Surgeons ever associated together in the world; and if this association shall produce results in any manner comparable to those produced by

other American associations, now the wonder and praise of the world, the character of an American Dental Surgeon will stand as high on the archives of science as do the names of Washington, Franklin, Hancock, Henry and Jefferson on the roll of freedom, or Mills, Judson, Perkins and Hill in the annals of American missionary benevolence.

The benefits that result from association, as great as they undoubtedly are in commerce, politics or the agricultural interests, are still greater in science—for the plain reason that the results of the gainful and thrift-increasing pursuits furnish incentives to action that the occupations of art and science fail to supply. The acquisition of knowledge is not always the acquisition of wealth, although knowledge always is power. Thus the more striving and bustling pursuits of life have, in general, greater charms for men than the more studious and sedentary, and the student is thus compelled to make many sacrifices of feeling and inclination, especially in the earlier part of his career, while he is accomplishing his mind, maturing his judgment, and arming himself with power to combat disease, or remedy the defects of nature. Science, long pursued, may indeed lead to wealth, but the man who cultivates science merely for the wealth it will give him, can scarce be actuated by that noble enthusiasm of mind on which true perfection in all science is based. It also leads to consideration among mankind.

So necessary is association to the advancement of science, that the latter has rarely flourished without the aid of the former, and that age of the world is found ever the most illustrious in letters and science in which the bonds of scientific association were drawn the closest, and the brotherhood of art the most warmly cherished. In aid of the great professions of life, the various institutions, so famous throughout the world, were at first organized. From small beginnings and dubious experiments, they have risen to gigantic strength, throwing out annually, in their voluminous transactions, the aggregate wisdom of such a mass of mind, acting under the strongest impulse of competition, and the desire of distinction among the wise and learned of the age.

The history of one scientific association is generally the history

of all. They come to a maturity in numbers, influence, respectability and power over public opinion, sooner than their most ardent friends anticipate, becoming almost a wonder to themselves, as the history and experience of the Society which I now have the honor to address, fully testify. Three years ago, about fifteen or twenty gentlemen composed the whole of this association, now embodying upwards of a hundred and thirty members, found in nearly every part of the Union and in adjacent islands of the ocean. Such an accession of talent, influence and members was scarcely dreamed of by the most sanguine of its friends; and equally vain will it be to attempt any estimate of the future increase of the Society, or the good that will result from it. Time only can unravel the destinies of this organization, commenced as it was in accordance with the spirit of the age, and urged on by the claims of nature upon the aids of art and science. No one can wonder at such speedy results of concerted action, who has ever reflected on the power of involution, possessed by principles as well as numbers,—a progressive quality of association, strengthening with progress, and gathering weight and volume with the increase of its movement.

The numerous and highly important improvements that have been made both in theoretical and practical dental surgery, in this country, during the last ten years, indicate the stand that American dentistry is expected to take on the broad theatre of the world, amidst the national rivalry of the elder continent, the hoary home of the arts and sciences, when our land was hidden from the race of man by an untravelled ocean and boundless forests.

The highest and most ardent ambition should be cherished by the dental profession in this country, "redeeming the time," and putting each moment to its appropriate use as a part and parcel of the national character for useful science. Ten years ago, an accomplished dentist might have been pardoned for the thought that his art had arrived to perfection; but what astonishing discoveries and improvements have been made in this department of surgery within that time! And who shall say that the succeeding ten years may not be as pregnant with improvements as the past?

One of the most beautiful features in dental surgery is, that,

while its operations are confined to one set of organs, its studies and principles must of necessity embrace the whole body; for, long since, has the question "how *soon* can one be qualified for any branch of medicine or surgery?"—been substituted by the inquiry, "how *well* can he be qualified?"—Time spent in study, when compared to knowledge acquired, is but a trifle; and the institution of the American Society of Dental Surgeons recognizes the great principle that each member is still a learner—that he is teachable as well as teacher—and auditor as well as lecturer—a student as well as a professor.

To the keeping of scientific dentistry has been committed the care of the diseases of the mouth, the seat of the sense of taste, from which so great a portion of the happiness of existence is derived. The dentist has to do with organs in whose condition, health, beauty and comfort, are involved—organs that are connected with nerves which throb with the keenest agony in suffering, or thrill, tremulous with the most delightful sensations in the full tide of health and enjoyment; and with organs so vital, planted so close to the brain, the sensorium of the system, skilful should be the hand, steady the purpose, and perfect the knowledge of the artist and operator, whose work lies so near the throne of being.

To the general stock of knowledge which it is the design of the American Society of Dental Surgeons to accumulate, each member should contribute. The learner should assume the station of teacher, and communicate as well as receive. Mere silent membership should content no one. All the mental and physical energies of every member of the association should be summoned to produce something worthy of the public depository of the Society's knowledge; and with a view to this, we should all be continually adding to the stores of our knowledge and experience, and never consider our professional education as completed. As we become more and more accomplished in our profession, we will the more discover the connection of the dental apparatus with the structures, functions, diseases and sympathies of other organs of the body, and thus be constantly acquiring information that will make us more and more competent to the mastery of the difficult and intricate cases that are continually coming up in the

practice of every dental surgeon. Let us not then consider our membership in this Society as a signal for relaxation in study, or as a diploma that we have reached the Ultima Thule of professional knowledge. No man can ever reach the farthest boundary of true science; a life time is too brief for the attainment of absolute perfection in art.

Therefore, membership in this Society should be regarded only as entering into new obligations to apply ourselves more diligently to the cultivation of the science and art of dental surgery, and while we are doing this, we will at the same time be elevating the profession we have chosen for life—for usefulness—for fame.

It is a law of the human mind that no fixed standard or bound of perfection can be considered the *ne plus ultra* of achievement. The attainments of industry and perseverance are always in the ascending series, higher and higher, the effort only a short distance behind the conception, and the design ever growing more perfect on the base of the previous achievement—and the work again still more complete in proportion to the improvement of the plan, aided in the execution by the increasing acquisition of experience, and the progress of taste and the creative faculties towards that sublime point of perfection that may be found only among the unchanging models of a perfect creator.

Thus the great masters of statuary in Greece and Rome, each one endeavoured to form a perfect statue of

"The goddess that enchants the world ;"

and although the might of stupendous genius and long years of patient toil were expended in the effort, one single statue could never express all the living sentiments of beauty. Another artist would strike upon another lineament of touching tenderness and emotion, and another upon another, until nature would weary in loving the impress of mind and passion given to the chill and unthinking stone; and still the work has not been done, and modern sculptors are in as earnest chase after the ideal perfection of beauty as were the ancient. Thus should it ever be in that profession which unites art and science and binds them as

vassals and ministering spirits to the pleasure, comfort and health of man.

The honor of science is implicated in the transactions, whether worthy or unworthy, of the American Society of Dental Surgeons; and, if any body of men in the country can be considered the life guards of the dental science, it is this national society. To us are committed the interests both of the art and its principles for the continent, and dentistry itself shall be elevated or depressed in the great—the sacred trust. The dignity of the commission we hold includes, in its consideration the elements of national character, and as we execute it, so will our branch of the great scientific character of America stand out in bold relief, or fall back into shade and obloquy. The high renown of the other branches of the profession of surgery and physic, summon us, “trumpet tongued,” to illustrate our branch, crown it with respectability, and make its exercise a blessing to humanity, and an honor to the country in which it is practised. We should feel, while we hear almost daily of the splendid achievements of general surgery—the triumphs of skill over disease—as did the ambitious youth of antiquity whose sleep was taken from him by the victories of a successful conqueror; he could not rest while another was reaping such a harvest of glory—neither should any member of this association while surgery and even our own branch of the curative art are performing achievements every day, that a few years since would have been considered as impossible—as beyond the reach of human skill.

The dental as well as the general surgeon, has to deal with living organs—organs connected most intimately by a thousand sympathies with almost every part of the human frame, and liable to be the cause of disease in other parts of the system, as well as to suffer in the derangement of other organs. No organ is more closely allied to the nervous system than the teeth. This, of itself, calls for a thorough and correct knowledge of the nervous economy, for knowledge of every affinity connecting the facial nerves with the dental arch, so as to enable us to manage all those numerous cases of neuralgia, so distressing to be borne, and so hopeless of

cure in the hands of ignorance and quackery. The general surgeon indeed, is often called to perform operations of greater magnitude than the dental surgeon, yet his department never calls for any more mechanical or artist-like skill than dentistry does—nor are his operations generally of a more minute and delicate character, than are those of the dentist. The one deals with flesh, muscle and bone—all of which, when wounded, have in themselves a renovating power of granulation and reproduction; the other deals with organs which have no inherent power of recovery from the ravages of disease, where art must meet and resist the assaults of the destroyer, and where skill alone can repair the infraction of accident, violence or decay. While the former removes the unhealthy or hopelessly diseased limb, the operations of the other must meet disease at its threshold, and pluck from the system the slowly germinating seeds of organic derangement, and as nature has combined utility and beauty in the teeth, they should be watched with the most assiduous attention and consummate skill. Some oriental writer calls the teeth the “pearls of beauty,” and it follows that the accomplished dentist would be the “pearl keeper”—the conservator of those organic gems, which, once lost, have no reproductory power, and can only be substituted by the hand of art instructed in the schools of science.

The enthusiasm of an artist in dentistry has full scope—the creative and imitative can come into full play—all is not dry study, theory, abstract principle,—but it also can boast the excitement of the active mechanical arts—and thus the weariness of the student can be refreshed by the alternation of his instruments, the process of successful operation, and the satisfactory sensation of successfully copying nature, remedying her defects, adding ornament to beauty, and giving health to the system. There is, therefore, no excuse for want of enthusiasm in the dental profession. The dentist who does not feel the great impulsive enthusiasm of his work, of his designs, of his operations, will never carve his name on the monuments reared to skill and excellence by a grateful and honor-giving public.

But what are the associated duties we owe to our profession as members of the American Society of Dental Surgeons—what are we to do collectively and individually to bring our profession

to the highest perfection of influence, honor and reputation? And if in the answer to these questions, this opening address shall assume the character of utility rather than display—of plain common sense suggestions rather than polished diction and harmoniously rounded periods, it will be better suited both to the speaker and the occasion. All great associations, and even the most magnificent enterprises among men, must be conducted on plain principles and in accordance with simple rules, easily understood and rigidly observed. Thus the foundation principle of all scientific associations and societies, as in national governments, is a surrender of a few individual rights—the sacrifice of a little individual ease—for a general and a greater good. True generosity has often been called the refinement of selfishness, because of the real gain which ever follows acts of noble and self-denying kindness; so the giving up of private opinion sometimes, and the deference which one individual should ever pay to the opinion and the will of the many, are concessions of private right almost as sure to be repaid ten-fold, as are individual concessions to government to be repaid in protection, power, and general consequence and estimation among mankind. As one surgeon dentist, however skilful, learned and successful he may be, can single-handed and standing alone in society, earn only a reputation and fortune for himself, which, at death cease, and belong to him as a living man no more;—the necessity of associated effort and influence becomes apparent, and the American Society of Dental Surgeons, kept up in peace and concert from generation to generation, shall become like the Persian band of immortals, a living member stepping in to sustain the station of each one who may fall in the exercise of his profession, and ripe with all the virtues of his calling and an extensive usefulness among his fellow men.

The necessity of this association to secure and perpetuate dental reputation is apparent to every well informed dentist. The world at large never can know what an immensity of labor, study, mental and manual discipline it requires to accomplish a man thoroughly for the skilful practice of Dental Surgery, and this Society can only, as its members act collectively, appreciate individual worth in the profession, and if they do this, their archives are destined to become wealthy in the record of departed merit,

as well as the rich repository of living research, genius and literature. Already have the muses smiled from Helicon on dental toil, and the goddess Hygeia, blushed with a more rosy beauty at the song of enchantment which celebrated the achievements of the art, and its connection both with health and loveliness; and other poets shall arise, like Darwin, Marmont and Brown, to crown the pale brow of "star-eyed science" with bays of poesy!—

Take care of yourselves; your fame—reputation—your men of talents—your improvements—discoveries—inventions—and every thing relating to your noble art, would be the injunction which the Genius of America, could she make her voice audible to mortal ears, would address to you! And to do this fully and effectually we must, with one accord, enter heartily and energetically into the great and sublime spirit of association—take hold of the mighty strength of numbers, and honor science itself by elevating and sustaining ourselves on that eminence of moral, intellectual and social dignity, where every votary of science should ever be found.

Let it not be thought presumption in your speaker, selected to deliver the opening address, commencing the present labours and sittings of this respected body, to make some plain suggestions in regard to the best manner of sustaining our profession, our society, and ourselves as dental surgeons.

I. Selfishness must be succeeded by a generous and conciliating spirit of self-denial. The christian virtues look lovely and shine every where. If any one member expects to obtain all the consideration, and wear all the honors of the Society, already so large and destined to become still more numerous, learned and influential, I will venture to say he expects too much, and that which can never reasonably be accorded. No man, however long he may have been in the profession, or however eminent he may have become in it, has a right to be considered infallible; nor should he feel chagrin or the bitter gnawings of envy, if some younger man, some one who came later into the field of dental surgery, aided perhaps by a more liberal course of study, or a more elevated structure of mind, should dissent from his theories,

and institute a bolder practice on a broader basis of reasoning. Farewell to peace and honor and justice and truth and well-grounded fame, if the demon envy be permitted to take a seat in the halls of science—to hoot, like an owl, when night's sweetest bird of song pours out the tender melodies of sympathy—or curse, like Haman, at the rise and prosperity of others.

2. Too obstinate a tenacity to favourite theories, and too bitter proscription of the theories of others, should be surrendered to preserve the harmony of associated bodies. The fact that there is generally something good in all theories—something that may be winnowed, like wheat from chaff, even from grotesque absurdity, should make us all tender even of each others errors. And to run into erroneous speculations, at times, proves the activity of the mind that thus wanders, and gives promise that such vigorous exertion in search of truth will soon find the priceless pearl, even if it were sought in the wrong direction at first. General and temperate discussions in associated bodies, and an extended and teachable correspondence with eminent practitioners, have the double effect of making and cherishing lasting and valuable friendships, and settling favourite theories on foundations that time, which destroys most things, shall only beautify and consolidate.

3. One of the first principles of an association like this, should be a friendly spirit between the members,—mutual respect for each other, and that condescension and deference which prevail among gentlemen everywhere. The idea that professional men must be Ishmaelites towards each other, and while they build up their own reputations with one hand, carry a sword in the other to repel attacks or assail others, is a false one, and has done more to discredit learned professions than all other causes combined.

If we, brethren of the same profession, cannot use each other well, how can we expect the world will treat us with consideration and respect. There is in the community a stern disposition, whenever a member of a profession indulges in tirades against his professional brethren, in detractions, vituperations or sly inuendoes, to consider the whole profession either as wanting in courtesy, or ignorant pretenders—the one as bad, only a little more abusive than the other. If we as members of the American Society of Dental Surgeons, pursue this suicidal course towards each other,

we shall both earn, deserve, and receive our full share of infamy and disgrace, which shall burn the deeper through skin, flesh and bone, inasmuch as a brighter destiny had been entrusted to our keeping, and we had proved ourselves recreant to our interests, and, indeed, unworthy of any better fortunes.

4. Our common safety and that of the community should make us as honorable men, implacable against the advances of quackery. The well-informed dentist can hold no fellowship with ignorant pretension. War is on his shield against the man, who, in this age of the world has not enough of honesty and ambition to qualify himself to perform highly important operations on delicate and most sensitive organs of the human body—organs so highly essential to the enjoyment of life, health and beauty, as are those of the dental arch.

5. The character of our profession and Society imposes on us the sacred duty, by advice, counsel, warning or direct assistance, of aiding those who may have been unfortunate, or who are just setting out in the profession. The very vigor and nerve of our opposition to quackery, should arm us with sympathy and consideration for all who are endeavouring to qualify themselves for respectability and usefulness in the profession. The old and well-learned practitioner will lose nothing by this generous attention to the interests of another; but by it, he binds the stranger and young aspirant to him by the strong cords of gratitude—makes him ever his friend, and convinces him by deeds that cannot lie, of the real existence among professional men of a hearty, noble, generous sympathy in the welfare of another.

6. The duties of our brotherhood in the great cause of science impose on us the obligation, when any matters of difference shall come up, (and come up they probably will,) between any of us and a professional brother, that we should first go to him, and learn his cause of grief, action, or offence, before the matter is given to the four winds, and all the babbling tongues of scandal to twist and torture into the most monstrous shapes of moral obliquity. One such friendly visit oftentimes puts out a flame of rising anger that might have illuminated a wide district of country, and in its lurid glare shown only the dark and diseased shadows of the human heart—the black vortices of shame, revenge, and every

ungenerous, unlovely passion which the tempter of man ever planted in the deserts of the soul. A man never shows his weakest and darkest points of character, until he gets into a bitter and most implacable controversy with another; and then, when he is pouring out gall and wormwood upon the naked head of his antagonist, and, as he supposes, using him up, root and branch, before he is aware, he finds the whole public in possession of the fact, destructive forever of his own fame and reputation, that he is a quarrelsome, and unfriendly, and revengeful man; and he finds out too late that his great controversy has been against his own character, and that he has, indeed, come off most irretrievably triumphant! A little patience, forbearance and investigation will set most matters at rest before the winds howl from the wilderness, and the turbid waves of passion begin to roll.

7. For the purpose of securing or obtaining practice, no honourable, high-minded and well educated dentist will perform his professional offices at prices reduced so low as not to afford him the best materials for his operations, and a fair, generous compensation for a proportionate part of the time and expense of his education, and for the time actually spent in performing the operation. He should not be extortionate, and like the dentist in the story, who had but a single case in the year, charge a year's salary for the extraction of a single tooth; but yet he should never undercharge a professional brother for the sake of drawing away his patients. This is an act of meanness which even the want of bread would hardly justify. It is suicidal, for the man who performs cheap operations, by the common sense of mankind, is ever held in cheap repute, and always rated at his own price. It is suspicious to boast of cheap operations. The question comes up always,—can they be good operations? and good operations they cannot be, unless they be executed in the best manner, and with the best materials.

But, before I dismiss this part of my subject, I beg that any remarks I have made may not be construed as an assumption of advice, or as proof that I believe any of the dangers against which I have warned gentlemen of the society, or any unseemly practices derogatory to the dental profession are now in existence. I warn only against what may, in the course of time, become

possible—against far distant, and, I would ardently hope, forever remote dangers. The great and high interests of the association; its lofty stand as the first regularly organized society of dental surgeons in the country, if not in the world; the deep solicitude I ever have felt, and must ever feel in its welfare,—all must be my apology if I have pressed any point of etiquette, or any standard of professional perfection too far or too high. I would lay to my own heart the spirit of my cautions with as much earnest severity of faithfulness as I would wish any other member of this Society, where so many may exceed me in professional accomplishments—if not in ardour in the common cause of science.

Among the general topics of interest to the American Society of Dental Surgeons, I doubt not that the Baltimore College of Dental Surgery will be considered of sufficient importance to merit notice on the present occasion. The first College of Dental Surgery ever known in the world, cannot but be an object of interest to this association. The fact that a thorough dental surgical education can be obtained at this institution, and that those who graduate in it, go out with advantages that can seldom be obtained from private instruction, will ever, it is believed, connect its destinies with the welfare of the profession in this country. Those who have graduated in it have gone forth with much of a general surgeon's knowledge of anatomy, with much of a physician's knowledge of physiology, pathology and therapeutics, besides an amount of special surgical knowledge incident to the peculiar branch of their own profession, and a knowledge of the various mechanical manipulations pertaining thereto, that they might have spent years in vain to acquire alone and uninstructed.

The importance and even necessity of greater facilities, than those which have hitherto been enjoyed, for the acquirement of a thorough dental education, is felt, and cannot but be admitted by the members of the profession generally. Few think of entering into the practice of general surgery and medicine, without the advantages of collegiate instruction in those departments of science. Without this necessary preliminary preparation, few become thoroughly qualified for, and gain a footing in respectable practice. And do the practitioners of surgery and medicine need a more

careful, finished and thorough training than do those of dental surgery? Every well-educated dentist will answer, No! Shall a profession then that has suffered so severely as has ours from the accession, to the exercise of its duties, of the ignorant and unlearned, if not unprincipled and designing, not endeavour to remedy the evil? The acknowledged fact, so honorable to those concerned, that many have reached a proud professional eminence without college advantages, is no argument that they are not needed. These exceptions to the general rule, the eminent self-made surgeon dentists of the country, all will bear witness how hard, almost impossible, it was to achieve their reputation by their own unassisted energy; and all such, I have no doubt, will have satisfaction in extending to the profession, and to the country, every advantage and facility for the acquirement of a knowledge of the art, by aiding and encouraging all well conducted efforts for the accomplishment of this most desirable and highly important object.

The beneficial effects resulting from the publication of the *American Journal and Library of Dental Science* upon our own immediate branch of the curative art and the standing of the profession in the community, are such as should commend it to the brotherhood generally. It has become the medium of intercommunication between the members of our profession—the repository of much valuable information—and the arena on which discoveries, principles and modes of practice are discussed and put to the test of experience. In view then of the advantages that result from it, it is to be hoped that it will continue to be sustained and prosper as a rich evidence of the industry, vitality, intellect and energy of the society whose organ it is, to disseminate its principles and sustain its character.

The formation of the Virginia Society of Dental Surgeons since our last meeting, is an event that should be hailed with pleasure by the members of this association, inasmuch as it gives promise that numerous other similar societies will be organized, at least, in the larger states of the Union—the very existence of which will be a chill to empiricism, a nipping frost to the precocious

flowers of dental imposture. The formation of the Virginia Society, as perhaps most of the members of this association already know, was the result of a convention, assembled in the city of Richmond, December 12th, 1842; and may we not hope that the example of the "Old Dominion" will be followed by our professional brethren in other states. Indeed, it is in the power of the members of this, the American Society, not only to have state societies auxiliary to this, established in all the states, but also to have state laws passed, guarding the community from the injuries and deceptions that are annually practised upon it by ignorant pretenders to dental knowledge, whose acquaintance with the principles of dental surgery is too limited and superficial to enable them to pass an examination before a body of men competent to judge of the qualifications necessary to be possessed by those who practise in this department of surgery. This legal protection against empiricism would be of vast importance to the welfare of community, inasmuch as the more it would depress ignorant pretension, the more it would elevate real science, and give importance to those whose habits of study and perseverance have made them masters of the profession.

In most countries, and in most of the states of the Union, the laws have instituted guards around the professions of general surgery and medicine, protecting them from the approaches of ignorant pretenders, thus guarding human life, and promoting the public good; but dentistry has been an open field, without any of the salutary enclosures of legislation to protect it from the depredations of any adventurer who might choose to prowl through the community. This is an evil which the profession generally, should endeavor to have remedied. The attention of this association was directed to the subject, at its last anniversary meeting, and a resolution was then adopted, recommending its members to use their exertions to obtain the passage of laws, in the states in which they respectively reside, for the protection of the public against empiricism in this department of the curative art. Indeed, the propriety of the formation of state auxiliary societies, for the purpose of securing the more speedy accomplishment of this object, has been discussed by several of the members of this body; and the subject is certainly worthy of consideration, and from

the favourable manner in which it seems to be regarded, I doubt not that it will receive the attention of this association, and be annually recommended, until the escutcheon of dental surgery in the United States, shall boast as many stars as the banner of the Union, and until this body, sustained by twenty-six state societies, shall assume the station in this department of science which the American Congress sustains in the political relations of the country. Then will our resolutions, our discoveries and improvements, and the great impulses we may give to science and art, be taken up, and reverberated from the sunrise to the sunset of American empire. Then shall our acts be re-echoed to the basis of the Rocky Mountains, and through their stupendous gorges, the mountain gates which the Creator opened in the great West, to the far shores of the Pacific Ocean.

There is something beautiful in the contemplation of the introduction and growth of the dental science in the United States. From Europe the first glimmering lights of the profession were introduced almost by chance, like wandering rays from a distant source. But those rays fell upon a country full of the boundless materials of science—a luxuriant field for its development—an acute, enterprising, inventive people—and no wonder that the result has been the astonishing perfection to which it has now attained. And, while its progress here is flattering to the pride of our country, it is but just to acknowledge that the instructions received from the “father land,” constitute the corner stone which lies at the base of the lofty American column of dental surgery.

The first knowledge of the science introduced into our country, about seventy years ago, along with the antagonistic armies of England and France, and the teachings acquired by some American youth from the great masters of the art in France and England, have been the sources of most our subsequent improvements. From these small beginnings the first dental journal, the first association of dental surgeons, and the first college of dentistry in the world have sprung. We can now have the satisfaction of contemplating the recent establishment of a journal of dental surgery in England, as a transatlantic approval of our course, and as lending the sanction of English surgery to our example. As

a direct and natural consequence of the English journal, we anticipate the formation of an English association of dental surgeons, and, perhaps an English college of dentistry; and, still farther, may we not hope that the example of England may have its due effect upon the Continent, and that a journal, an association and college may also be established there—thus making a three-fold chain of defences against quackery—a triangular fortress to command the respect of the world, and a “three-fold cord not easily to be broken” of scientific associations, in different realms, of educated gentlemen, pledged to the improvement and protection of an art and science so preservative of health and beauty as is this branch of surgery! Such a three-fold intrenchment against erroneous practice would defend the civilized world against the inroads of quackery, and give an unexpected elevation to professional skill in this department unknown to those who have preceded us.

The establishment of a British national association of dental surgeons, now agitated in the metropolis of that empire, if achieved, we shall regard as a full-orbed omen of the accomplishment of our most ardent anticipations; and thenceforward we shall lay aside any fear for the final triumph of our art, and the elevation of its professors, *pari passu*, with those of general surgery, to all the high consideration which legitimately belongs to scientific gentlemen, engaged in remedying nature’s defects and ameliorating human woes.

The insignia, or coat of arms of the American Society of Dental Surgeons, (also adopted by the British Journal,) designed and drawn by one of the most talented and highly esteemed members of this body, Dr. Maynard, of Washington City, is a polyandrian column, based upon a rock, surmounted by the lamp of science, throwing its rays above and around, encircled by the cognomen of the Association. I need not say that there was a happy genius in the conception; and should three such pillars rise from different empires of the globe, and should the radiance of each commingle with each, giving and receiving reciprocal splendour, communicating the warmth of friendship as well as the light of intellect, the effect would be as salutary to mankind as the scene would be morally sublime. It would of itself honour science, by adding

strength and unity of purpose to its defences. Against three such columns, so planted on the rock of truth, and so illuminated by the "star-eyed" radiations of science, the waves of error might dash in anger, but they would dash in vain. In storm or calm, in "gloom or glory," those same changeless lights would shine, those same polyandrian columns stand unshaken, and those same adamantine rocks beat back the baffled surges, still bearing unmoved those glory-tipped pillars, as light-houses of scientific discovery, and as monuments of associated intellectual energy, devoted to the best interests of mankind.

Gentlemen of the Society—all our former meetings have been most emphatically re-unions for business—assemblies of true and zealous working men. Let not this character of promptitude, despatch and energy die away and subside, like some wave, driven upon a distant shore; but let it increase, gaining force and celerity to the end; ever making the Society, at each annual meeting, the great central beehive of the profession; or rather, let it be the overflowings of a vast central fountain, fed by springs that wander hither from every point of the compass, filling the fount to the brim—then rushing back, all over the country, in healthful, silvery streamlets, carrying comfort and happiness to the afflicted wherever they go—away, over hill and through rich valley, again to feed and replenish the springs that shall again flow back their wealth to the centre; or, let the members from the several states of the Union be like the caravans that annually journey to some metropolitan mart of splendour and opulence. Over hill and dale they move, and each setting sun sees them nearer their destined goal. They are laden with the harvest and products of a thousand different climes, and when, in the great exchange of nations, they have deposited their garnered stores, communicated and received the news of a hundred principalities, they return, laden with richer wealth, back to their native climes, carrying with them the treasures of India, and "the spices of Araby the blest;" going to the great convocation with the riches of a year's labour and experience, and coming back strengthened in the arduous path of duty, by all the knowledge, honour and encouragement that had accumulated at the centre.

The relation of this, the great central congress of this branch of science, to the state societies, (if this association shall determine on the formation of such,) when they shall have been established, will bear a resemblance to the stately and umbrageous banyan of the tropics—the parent stem towering heavenwards, spreading its arms wide on either hand, covered with broad and verdant foliage, and every limb that droops to the earth, borne down with a freight of beauty and fragrance, shall take root there, and become both branch and trunk—another brave and strong supporter to the flowering pile or tower of wild and enchanting beauty; and see! another and another of the branches, as they shall bend to become the family supporters, twin trunks of a multitudinous tree, pillars to a sylvan temple, wide enough to shelter a nation beneath its spreading arches; or as Milton says:

“Branching so broad and long, that in the ground
The bended twigs take root, and daughters grow
About the mother tree, a pillar’d shade,
High over-arched, and echoing walks between.”

Gentlemen of the American Society of Dental Surgeons—I pause; not because my theme has become exhausted, or that the flame of my zeal in the cause of scientific dentistry flickers low on the altar where long it has burned. I only pause that your valued labours may begin—that the beehive of mental industry may begin to hum with your labour; that its stores may begin to swell with the wealth you have brought from your several fields of practice in distant cities and states; and that we may all become pleased and animated students once more, learning of each other in turn, and profiting by all.

Gentlemen, in this, the close of my salutatory, I welcome you to this anniversary meeting—to these halls of deliberation—to the labours of the session—to its enjoyments—to the greetings and hospitalities of the “Monumental City;” and may a gracious Providence preserve your lives many years, to achieve the greatest amount of good, both to yourselves and your fellow men.

ARTICLE II.

Dissertation on the Morbid Sympathies between the Mouth and other parts of the body. Read before the American Society of Dental Surgeons, at its fourth Annual Meeting; Baltimore July 19th, 1843. By THOMAS E. BOND, JR. M. D. Professor of Pathology and Therapeutics in the Baltimore College of Dental Surgery.

THE body of every animal is wisely contrived and perfectly fitted for the purposes it is intended to subserve. Every part, however minute, is necessary to the complete performance of the work of the whole machine, and a beautiful unity of purpose and dependence of parts is observable throughout the entire organization. So remarkable is this unity and dependence, that a naturalist, by examining a fragment of any one of the bones of an animal, may at once determine the character of the individual it represents. Because, having ascertained the size, figure, &c. of any one bone, he may reason with infallible certainty, that every other part of the body to which it belonged, was formed in perfect proportion to this part, and with strict reference to the purposes for which this particular portion was designed. Should a naturalist ascertain that a single bone presented to him, was constructed for purposes of prey, he would immediately infer that a beast so provided must have had strong muscles and bones of the neck, and jaws to enable it to hold and tear its prey, hind legs of such formation as to enable it to spring upon it, claws to seize and hold it, and a digestive apparatus suited to the reception and assimilation of food thus procured. In short a body is a unit, and though for the sake of description we speak of its several parts, it is a great whole, fed by one aliment, nourished by one blood, vitalized by one nervous system, directed to one purpose and obeying one general law of sustentation, decay and death. Those who are familiar with the writings of Cuvier, will not need to be reminded of his beautiful reasoning upon this subject. Now as one part of the body is so identified with the others, it is necessary that a certain organic understanding (so to speak) shall exist between the several parts, in order to enable them to act in

concert, in carrying on the business of life. For instance, in the human body, the *eyes* must act together; the *muscles* of the *trunk* must aid those of the *limbs*, and many other agreements of motion must subsist between the distant parts of the frame. *Then* again, the body has not only to perform certain primary works, by which it may be continued in being, &c. but being liable to injury, and being constantly assailed by enemies from without and within, it must have certain signals of suffering, and arrangements of action, by which any part more particularly attacked may receive succor from the rest. *Again*, being connected together by extension of tissues, or by the intervention of their lamina of other structures, by blood vessels and by nerves, morbid conditions of one part are necessarily propagated to others—all this concert of parts whether physiological or pathological is called sympathy—and constitutes one of the most interesting and beautiful peculiarities of organized structures. In many instances the dependence of one part upon another is so direct, and the mode of communication so evident, that there is no difficulty in detecting the process of sympathetic action or suffering that may be observed between them. In other cases this concert of parts depends upon undiscovered links of union, and is known to exist only upon the evidence of common observation.—Besides this sympathy of parts, there is a general interest of the whole organism in the welfare of all its parts, and severe or long continued suffering in any one however relatively unimportant will commonly create a general disturbance of health, and may involve the whole frame in serious and even fatal disorder.

Although in many cases no change in the structure of morbidly sympathizing parts might be discovered upon autopsic observation, yet there is good reason to believe that sympathy of this kind is in fact a transfer or propagation of actual molecular change—and every physician knows that a disorder, primarily of little importance may prove fatal by involving vital organs in a sympathy of disease.

It cannot, therefore, be predicated of any organ that its suffering is necessarily unimportant to the health of the whole system; since *experience* shows that the danger of almost all disorders, depends very much upon the sympathies likely to be established in the course of their progress—and the importance of these sym-

pathies is not always regulated by that of the organ originally involved.

In compliance with your request I will proceed to comment, in that brief manner which the nature of the occasion requires, upon the morbid connexions of the dental structures with other parts of the body.

The subject naturally resolves itself into two parts.

1st. It will be necessary to inquire how far and in what way the particular structures in question are influenced by the disorders of other parts. 2d. How far and in what way other parts are influenced by diseases of the dental arch and appendages.

The teeth, are affected by all the disorders that interfere extensively with the complicated process of assimilation—*scrofula*, *scorbutus*, and indigestion, from whatever dyspeptic cause, are sure to produce more or less disease in the dental apparatus. The first of these, *scrofula*, being often inherited, and developing its mischievous nature very early in life, influences the teeth during the important process of formation and by preventing their perfect organization, renders them unable to resist the influences of morbid causes, which, otherwise, might not be sufficient to cause decay. Unhappily this terrible disorder is most commonly inherited and is generally incurable—nevertheless much may be done to prevent the rapidly fatal encroachments of *scrofula* upon vital organs, by the prompt and persevering use of hygienic means. It is not at all likely, however that any remedies of this kind can improve the feeble organization of the teeth, and therefore the skill of the dentist in these cases must be directed to the removal of agents capable of destroying the vitality of these organs, and to the mechanical repair of damage, already done.

Scorbutus or Scurvy.—This extraordinary affection, the pathology of which is not well understood, seems to be connected with, and perhaps to consist in such a vitiated condition of the blood as renders it unable to supply the wants of any part of the body. While every tissue and organ gives signs of suffering, the gums especially, become swollen, livid, soft and spongy. They are liable to bleed at the slightest touch, sometimes become deeply ulcerated and not unfrequently the teeth drop out.

The causes of scurvy are such as seldom operate upon other

subjects than seamen or prisoners. For a long time it was the scourge of navies, but now, owing to the provision made against it, it rarely produces much destruction of life. The treatment of this disease can hardly be considered proper to dental surgery.

Dyspepsia or indigestion, expresses only the mal-performance of an act which is the result of the combined effort of various organs. Therefore, as failure of function in any one will interrupt the healthy performance of the great common object, dyspepsia must be a general term comprising several disorders. Being immediately connected with the digesting apparatus, and in fact forming an important part of that great and complicated system by which aliment is received and prepared for assimilation, the dental apparatus can hardly escape injury when the other organs of this system are involved in suffering. Indeed the mucous membrane, which in the stomach and intestine is the seat of digestion, and in the mouth is continually pouring out important fluids from its surface and glands, is so intimately connected with the dental arch as to unite it in close sympathy with the more important organs of alimentation—a healthy state of the fluids of the mouth is necessary for the safety of the teeth, and it is not to be expected that the secretions of the mouth will be healthy, when the functions of the intestinal membrane are disturbed. Every dentist must know that it is a hopeless task to attempt to save the teeth from caries, unless the patient can be saved from dyspepsia.

Syphilis also, by vitiating the general glandular and secretory systems, produces such a state of fluids as may rapidly destroy the teeth.

Rickets very much delays dentition, and the teeth when protruded are liable to rapid decay.

The enamel of the permanent teeth is often craggy and worm-eaten (in appearance) showing its imperfect formation, though sufficiently hard. The fang during the progress of the disease, has been found somewhat softer than natural.

Febrile diseases, especially the exanthemata, influence the perfection of dentition. Measles very often leaves evidences of its visit upon the enamel of the teeth, in the pitted appearance which they present. As fever is always attended with vitiation of the

secretions of the mouth, we may readily perceive how any protracted disease of this kind may injure the teeth.

All serious diseases of the antrum, must involve the dental arch—inflammation may be propagated, nutrition impeded, caries communicated, and the arch actually broken up in the course of those often fatal diseases which have their seat in this important cavity. The surgeon dentist should be well acquainted with the various disorders and morbid growths which may be developed in the antrum. Early detection is often necessary in order to cure, and none is so likely to have the opportunity of discovering the hidden mischief as the dentist. The first symptoms of disorder are often felt in the teeth, and unless the dentist who may be consulted is able to point out the true nature of the evil, delay may be occasioned, and delay may be fatal.

Mercurial salivation (ptyalism) has often caused extensive devastation in the dental arch. Mercury, like every other gift of God, has been shamefully abused, and serious and even fatal injuries have resulted from the reckless administration of this most useful medicine. Unhappily, the occurrence of such calamitous accidents has induced such general and unreasonable prejudice against the use of mercurial medicines, that vastly more injury has been suffered by society by improperly withholding, than by the most reckless abuse of them. The feeling against mercury has been the common hobby horse of charlatans, and of unprincipled physicians, and it needs no little firmness to enable a practitioner to deal honestly with his patients in the use of this drug. From the fact that salivation is injurious to the teeth, dentists have been led to comment severely on the use of calomel, and they have done much to spread abroad terrible notions of the evils inseparable from the employment of this and other mercurial preparations. Some of these gentlemen have seen evidences of mercurial devastation in every form of disorder and variety of decay, presented to their observation, and to such, calomel is the one thing dreadful to all who live to eat, and eat to live.

I am well aware that salivation, especially if profuse, must be destructive to the teeth, and fortunately it is at length understood that ptyalism is not by any means necessary to the attainment of all the benefit of mercury. Salivation is an accident always to

be dreaded, and as far as possible avoided, yet even at the risk of it, mercurial remedies are often indispensable; inasmuch as life is more important than teeth.

There is no reason to believe that the use of mercury is injurious to the teeth, when salivation is not induced. Yet very often caries of these organs is most unjustly attributed to it. People are exceedingly apt to confound the post hoc, with the propter hoc, and dentists are as liable as other men to fall into this error. A patient who has escaped a severe attack of fever finds his teeth rapidly decaying. In great alarm he applies to the dentist, the latter examines the mouth, and asks his patient if he has been taking calomel—he replies that he has, and then the man of science, as at least he ought to be, breaks forth into a stereotyped and entertaining diatribe against mercury as the origin of all the evil? And why, might it not be just as properly attributed to the magnesia or tartar emetic the patient had taken?—The fever itself was sufficient cause for all the resulting evil, why then transfer the blame to the remedy by which that fever was subdued, and throw implied and perhaps ruinous censure upon the physician whose judicious use of this very drug has perhaps saved the patient's life.

Until I have other information than I now possess I cannot believe that the proper employment of mercury is injurious, and while I reprobate its abuse, and would consider the physician unpardonable, who would be careless or reckless in the use of a medicine capable of doing so much harm, I cannot but regard that man as the author of greater evil, who, by silly declamation against an important remedy, fetters the physician in his contest with the most formidable disorders.

Having thus rapidly glanced at several forms of disease which more or less affect the teeth, we will now, with equal brevity, enumerate some of the evils which may be inflicted upon other parts of the body by disorders of these organs.

And first we may remark that the teeth like other organs may propagate disease to adjacent tissues, or may, by becoming foreign bodies, produce disorder in neighbouring parts. By a wise and beautiful provision of Providence, parts which cease to be useful are thrown off from the body by the action of adjacent

parts. The dead portion becomes by the mere fact of its loss of vitality, an irritant to the very surfaces with which when in its normal condition it was placed in comfortable contact. It is evident that this irritation will be prolonged in proportion to the tardiness with which the foreign body is removed, and as the teeth require great length of time for their removal, the irritation produced by these when in condition to irritate, must be long continued.

Disease may be propagated too from the inflamed or ulcerated fangs to the lining membrane of the antrum, and thus the teeth may become the first cause of a series of morbid events, ending perhaps in fatal consequences. In the same way disease may be communicated from one tooth to another.

The irritation produced by the teeth may produce local or general disorder.

The *local* consequences may be either immediate, such as we have just described, or they may be produced at points more or less distant.

Among the first the most common is inflammation and abscess in the gums, and cellular tissue between the gum and cheek, next to these perhaps are some morbid condition often undiscovered, of the lining membrane of the antrum. Among the second class of local consequences we notice neuralgic affections of various parts of the face.

It is very important that painful affections of the nerves of the face should be traced to their true origin. Most cases of neuralgia that occur in these parts are not at all dependent upon dental irritation, but upon constitutional causes, which require general remedies. They are, for the most part, either intermitting neuralgias, originating from marsh poison, or symptomatic nervous affections, dependent upon general atonic conditions.

It is highly important that the dentist be able to discriminate these disorders well; so that he may act with judgment, either in removing teeth or saving them, as they may or may not be the cause of evil. Dyspeptic conditions may also arise from disordered teeth, as dental disorder may arise from dyspepsia. Sympathies cannot be one sided, and as the teeth suffer from a disordered stomach, so the stomach will suffer from disordered teeth.

When extensively diseased the teeth and gums pour out putrid matters which poison the saliva and unfit it for its purpose in digestion. Moreover the teeth are not able to masticate the food and it is sent into the stomach unprepared for being acted on by the solvent fluids. Besides, nothing is more sure to disorder the stomach than long continued pain, and when the teeth are a mass of disease, the patient is rarely exempt from suffering.

I have known dyspepsia and general ill health, amounting to entire disqualification for the business of life, to depend upon carious teeth, and to be removed by treatment addressed to these organs.

The process of digestion requires a concentration of nervous energy, and cannot be properly performed if pain calls off the nervous attention to another part. Therefore, for this reason as well as for others, pain is, of itself, a serious evil to health, and wherever located, if long continued it will destroy it.

If the teeth were otherwise unimportant, as organs capable of suffering much and long continued pain, they would be well worthy of the special attention of skilful surgeons.

But the teeth may originate general disorder. This may be effected as the consequence of the local disturbances, above alluded to, becoming of sufficient importance to involve the entire economy. Symptomatic fever may be set up as the result of local inflammation, or general functional debility may evince the imperfection of digestion. The nervous centres are also, under certain circumstances, so fearfully impressed by dental irritation as to convulse the remotest fibres of the frame, and even to overwhelm the powers of life.

It is very remarkable that these extensive and often fatal consequences do not result from diseased but from healthy states of the dental system. The regular growth of the teeth is frequently attended with most disastrous consequences.

The well known evils of first dentition, seem to depend upon the simple fact, that, this process causes prolonged suffering. The pain is the prime cause of all the mischief, though certainly the condition of the nervous and vascular systems which accompany the evolution of these teeth, forms a very necessary part of the array of circumstances which unite to produce such formi-

dable results. The very first symptom of severe dentition is found in the vitiated condition of the alvine discharges, resulting from irritation of the intestinal canal—extended perhaps to all the secreting organs connected with it. This fact points out the sympathy which exists between the mucous membrane of the mouth and its prolongation into the intestines. Very often, however, the brain and spinal marrow become most seriously interested; fearful convulsions attest the universal sympathy of the frame, and not unfrequently death results from the apparently trifling irritation produced by the pressure of a single tooth upon its gums.

And now, gentlemen, the simple inference which I would draw from the facts I have so rapidly stated is, that as the teeth are important parts of the body; and as the body is a unit—knit together by the closest ties, pervaded by one system of blood-vessels and nerves, and directed in the performance of its functions by an essential law of sympathy; as diseases of other organs affect the teeth, and conversely, the diseases of the teeth affect other organs—*therefore*, the treatment of the teeth is properly a branch of medicine, and none can be supposed to be qualified for it who are not acquainted at least with the elementary principles of medical science.

ARTICLE III.

Dissertation on Dental Caries. Read before the American Society of Dental Surgeons, at its fourth Annual Meeting; Baltimore, July 20th, 1843. By A. WESTCOTT, M. D., D. D. S.

Few interrogatories are more frequently put to the dental practitioner, than those pertaining to *dental caries*—and few, I am sorry to add, are more frequently, either evaded, or so indefinitely answered. Were the interest upon this subject, among the profession, at all commensurate with its importance, and the general solicitude upon it, correct information would have been more generally diffused, and a greater proportion of the present amount of suffering from its consequences averted.

That erroneous views are entertained, even by members of the

profession, upon this point, is fully proven by the fact that, men of unquestionable talents and acquirements, are to be found advocating the most discordant views relative to the pathology of this disease.

While on the one hand we are taught from high authority, that the teeth are, like the soft parts, subject to all the fluctuations of disease and health, in common with the general system, and that dental caries arise chiefly from constitutional causes, we are led by *another*, whose authority is *equally* deserving our respect, to discard almost wholly such causes, and to adopt the belief, that *after the teeth are fully formed*, we are to attribute their decay mainly, if not entirely, to the action of external agents. Theories are in many instances of very little practical utility, or from many of them, no rules are deducible, having a practicable bearing upon the health and comfort of man. For example, it is of little moment, other than a gratification purely mental, whether we explain combustion by supposing that during the process, phlogiston is given off, or oxygen added to the combustible; or again whether we account for calorification on the supposition that it takes place in the lungs, or, at the extremities of the blood-vessels, at the systemic capillary—or, whether we recognize a double or single agency, in explaining electric phenomena, or whether we regard chlorine as a simple or compound substance. In short, many ingenious theories are framed in the various departments of science, which but for the facts and genius elicited, in the necessary investigation, would be an idle waste of time. But while this is true of *many*, most theories pertaining to medicine or surgery, deserve our most careful attention and scrutiny; as on them are frequently based rules of practice of the utmost importance. Indeed, we may as well look for pure waters from a corrupt fountain, as for correct practice in any department of medicine or surgery, where false views are entertained of the origin and nature of the disease. Else why was the Broussain patient suffered to die without a laxative, while it was acknowledged by the most zealous advocates of his theory, that post-mortem examinations exhibited the bowels *distended* with the most acrid and corroding materials? Simply because the Broussain theory admitted of but one "*fons et origo*" of fever, viz. irritation, or inflammation of the

mucous membrane of the stomach—hence this viscus must not be *irritated* with a purgative—the alternative being, to leave in contact with, and subject the bowels to the constant impression of, these acrid materials, till either nature or her step-mother death, relieved the patient from his sufferings. If error in *theory* could induce such gross error in *practice*, with so great a man as Broussais, who has long and deservedly been regarded one of the greater lights of his profession, how carefully ought *we* to scan any theory before adopting it, especially where its practical tendencies are deleterious, who can boast, perhaps, of a less elevated genius and profound research, than that possessed by this great and enlightened pathologist.

The same remark relative to theories upon the general practice of surgery and medicine, will apply to *dental* surgery, modified only by the magnitude of the consequences, naturally following the adoption of a *true* or *false* theory.

Let us make an application of this sentiment while we examine some of the grounds taken in support of the opposing theories, to account for dental caries.

Of a subject requiring volumes to do it justice, it is not my purpose, of course, to take an extensive view in a short essay, but shall confine my remarks to the general cause of caries, *after the teeth have received a definite constitution*; or in other words, to the relative merits of the two opposing theories, the one referring this disease mainly to *constitutional* causes, and the other to the action of *external agents*.

That this disease is far the most destructive of any to which the teeth are subject, will be admitted by every practical dentist, and that the *preventive*, as also to some extent the *curative* treatment, will be directed in accordance with the view taken of the *cause*, is a supposition predicted by common sense, and verified by every day's experience.

How frequently when urging the necessity of greater cleanliness of the mouth and teeth, to our patients, are we met with an "Oh! 'tis of no use to take pains with *my* teeth—my constitution is so bad, or I have taken so much calomel."

Now to reason that when one has a cold, he has a cold in his teeth, or in rheumatism, the teeth partake of the disease, or that

they share the morbid impressions made upon the system by the small-pox, or in short every other malady to which *flesh* is heir, is but to contend,

1st. That a diseased system is necessarily attended by a diseased set of teeth—and as it is a generally admitted fact, that they possess no intrinsic restorative powers, it must follow—

2dly. That the teeth of an individual, at any given age, are labouring under the *combined* effects of *all* the diseases with which he has been afflicted up to this period.

Again, if caries depends directly upon disease of the general system, it is equally fair to conclude, that those persons who have inherited good constitutions, and have enjoyed uninterrupted health, must have good teeth.

Before proceeding more minutely to analyze the grounds of this doctrine, I shall lay down a few principles, the *truth* of which is, I believe, generally admitted.

1st. The soft parts of the system, possessing a free circulation, are more subject to attacks of inflammation than any other portion of the body, and also possess the greatest restorative powers—these though frequently attacked with inflammation, are seldom destroyed by gangrene.

2d. The *bones* of the general system, are more *feebly* endowed with circulation, are less subject to inflammatory action, and are less capable of restoring themselves from such attacks.

3d. The bony portion of the teeth is still *more feebly* endowed with vitality, and is proportionably less subject to inflammation, and has *no* intrinsic restorative powers.

4th. The enamel is beyond the direct control of the vital energies, and is of course, *destitute* of the power of self restoration.

If the above principles are correctly stated, and caries to any considerable extent depends upon constitutional causes, it must follow, that while nature has in relation to every other organ of the body, with almost a lavish hand, provided not only against attacks, but also for *restoration*, she has left the *teeth*, so essential in giving symmetry and beauty to the face, and in fitting man to enjoy the luxuries which the kind hand of Providence has spread so bountifully over the surface of the globe,—organs calculated to

enhance not only his comfort, but *necessary* for the maintenance of health, organs moreover, when diseased, that subject him to the most excruciating torture, to which his frame is susceptible—*these she* has left to destructive decay, which it is beyond the power of the sufferer to avert.

Nor indeed, are the services of the dentist, much less circumscribed. Though he may offer a *palliative*, perhaps a *remedy*, he cannot, a *cure*.

The hope of affecting a *cure*, without removing the *cause*, which if it be constitutional, is beyond his province, would be as idle, as the attempt, by stopping the *crater*, to extinguish the internal fire of the volcano.

This must have been so regarded by Mr. Koecker and others, who advocate internal causes of caries; for while they have devoted pages to the formation and description of internal caries, they have not given a paragraph relative to any *treatment* calculated to meet the exigency. Were not the reason as above stated so obvious, we should be led to wonder, that while Mr. K. assures us that "it may be laid down as a general rule, that *all* morbid influences, which affect the general health, must *naturally*, more or less affect the teeth, and that constitutional diseases generally, (and especially those of an acute character,) must produce morbid action of some kind *in* the teeth," he does not even hint at any constitutional *treatment* either preventive or curative.

But before bringing any charge against *nature* for withholding her protecting care over organs, in the construction of which she seems to have spared no pains, or adopting a *theory* so mischievous in its practical tendencies; let us see if there are not good reasons for suspecting its truth.

On the supposition then, that dental caries frequently arises from constitutional causes, I would inquire why we would not look for, even *more frequently*, cases of disease in the other bones of the system?

For if caries is ever internal, it must be preceded by inflammation of the bony structure of the tooth, as it cannot be acted upon by external corrosive agents, and as they are by their compactness of structure, less susceptible to inflammatory action, than the bones of the system, of the attacks of *either*, from constitutional

causes, those of the *bones* ought to be many fold the most frequent. That cases of inflammation of the bones, often escape observation, is hardly supposable, inasmuch as they are almost uniformly accompanied by intense, deep-seated pains. It is indeed a questionable point, whether osteitis ever terminate in resolution—and without admitting this supposition, the symptoms are always strongly marked. Now the number of cases of diseased bones, compared with the frequency of *dental caries*, would not be a drop of the bucket, whereas if this theory be true, by every known law of the system, they ought by far, to out number them. That it is fair to compare the bones of the system with the teeth, may be inferred from the fact that in organization they are similar, and in composition very nearly the same—the principal difference being the superior compactness of structure of the bones of the teeth, a fact materially favoring the supposition that they would be far less influenced by constitutional causes. But if it be objected that each has a structure and laws peculiar to itself, and that therefore it is unfair to make the one a representative of the other, it may be answered; that the bone of the *teeth themselves* below the crown, which is identical both in composition and organization, are never accused of *internal caries*,—nor indeed of any other, unless the gum naturally protecting it, has been wasted, exposing it to the action of external agents. Now I would ask what good reason can be assigned for *this* portion, being exempt from general disease, while the bony portion of the *crown*, as is contended by Fox, Bell, Koecker and others, partakes of every general morbid agent.

Can we then from the organization of the teeth, or from any known law of the animal economy predict *a priori* that internal caries is of common occurrence. Nay, on the other hand are we not constrained by such considerations to regard it, if it *ever* occurs as exceedingly rare!

From my early reading upon dental surgery, I adopted very naturally the faith of my authors, and became a firm advocate of constitutional caries; nor was it till after several years close attention to the pathology of this disease, that I was led to abandon it altogether.

My present opinion is, that after the teeth are fully formed, in-

ternal caries, properly speaking, never occurs; nor can I find any good reason for supposing, *after* this period, that their susceptibility to action of external agents, is materially enhanced.

I have often met with cases of what might perhaps be termed with propriety *deep seated* caries, and when the opening externally was so slight as to require the closest observation to detect it; but never an instance, where the aperture was not sufficient to give ingress to fluids which might act upon the *bone* of the tooth. The enamel being crystalline and of a structure differing from that of the tooth, is very liable either by mechanical violence, or the sudden transitions of temperature, to which it is often exposed to be cracked, so as to be pervious to corroding agents. This effect from the causes alluded to cannot have escaped the observation of any who have been in the habit of carefully examining the teeth.

So common indeed is it for the enamel to be thus checked, that I have seldom examined a set of teeth, with a view to the fact which did not exhibit them in some one or more of the teeth. The cases where the bony structure of the teeth most frequently, suffers from the penetration through these nearly invisible fissures, and which are most liable to be mistaken for internal caries, occur on the lower molars on the outer side directly under the central vertical depression in the tooth.* On sawing in two these teeth horizontally near the centre of the crown, we generally find the enamel covering this depression much thinner than upon the two convex surfaces, upon either side of this point, rendering it more liable to fracture, than upon any other portion of the tooth. This situation it may be observed also, is most favorable to receive the constant effects of any irritating fluid, which may chance to be in the mouth. Caries in this situation is frequently first detected by a dark bluish appearance under the enamel, often requiring the closest observation to see the fissure which gave

* The enamel of the teeth is often so cracked by mechanical violence, and especially on their sides, which come in contact with each other, by the pressure of the organs one against another, as to be penetrated by the secretions of the mouth; but the fissures within the indentations upon their grinding surfaces and in their sides, are in nearly every instance the result of the imperfect formation of this outer covering.—BALD. ED.

rise to it. This description of apparent internal caries, while it applies particularly to the lower molares is by no means confined to them. We find then, no difficulty in satisfactorily accounting for the direct application of those substances to the bony structure of the tooth which are known to act upon it, giving rise to caries.

With this brief notice relative to the liabilities of the bony portion of the teeth to receive the direct action of external agents, we will next examine the effects, upon both the bone and enamel of the teeth of some of the substances which are liable to be brought in contact with them. In order to secure greater accuracy relative to the supposed effects of certain substances, I instituted a series of experiments, conducted in the following manner. I prepared a water bath kept constantly at 98° by a spirit lamp, and regulated by a thermometer. In these were placed vials containing the substances to be tested. In each of these was placed a human tooth, care being taken to select those of as similar organization as possible, and whose enamel was perfect.

This list included about an hundred articles—those most commonly used as food, condiments and medicine. They were carefully examined every forty-eight hours, either by myself or my assistant, Mr. Dalrymple, a young gentleman fully competent to judge of the progress, and the effect carefully noted. The result of only a few of these will be alluded to in this essay, reserving a full report of them for a future article.

If these experiments are calculated to give us a true notion of the action of various substances upon *living* teeth, they furnish much important information, which I have been hitherto unable to obtain. That they do so in respect to their action upon the *enamel*, can hardly be doubted when we consider that this structure is beyond the direct control of the vital powers, and is hence subject to the same effect from chemical action, whether covering dead or living teeth.

And this is far the most important question to settle, as when this natural protection is destroyed, the teeth are always soon ruined.*

* We presume Dr. W. has reference to those cases where its destruction is the result of caries and no means used to prevent the farther progress of the disease, as it is well known to every dental practitioner that teeth often

In respect to the action of these substances upon the living *bone* of the teeth, it must be confessed, there are many modifying circumstances, such as original difference in organization, difference of the age of the subject, and other circumstances connected with vitality, which would vary the action of these chemical agents, yet can it be supposed that the feeble vitality of the tooth is capable to any considerable extent, of *counteracting* the affinities of the substances established by these experiments in respect to dead bone.

But we need not rely solely upon this negative evidence, to believe the bony portion of living teeth *very* susceptible to the action of chemical agents. In many, and perhaps we may say, in most instances of caries in teeth, strictly speaking, there is no cavity till the carious portion be excavated, and what becomes such on being cleaned, was filled with a substance resembling cork, which must be regarded as the animal matter of the tooth, the earthy portion having been taken up by the action of acids, which by the by must be regarded as the main, if not the only substance effecting the teeth by chemical affinity.

Now what is the succession of steps in this destructive process? Do these substances first produce inflammation and death of the bone, and *then* chemical affinity step in to *complete* the process by acting upon its earthy matter? or rather does not the process essentially consist in the acids attack upon the earthy portion; or is not an acid capable of affecting this interstitial decomposition, *unaccompanied* by inflammation?

If in the cases supposed, the acid is neither the direct agent of inflammation, nor is capable of taking up the earthy matter of the bone without inflammation, why is it that we may predict with certainty, that those acids whose affinity for lime is greater than the acids united with this base in the teeth, will readily destroy them? I have been led to suppose by closely observing the phenomena of caries, that acids not only give rise to inflammation of the bone by their direct attack on, or affinity for its lime, but that this action was not unfrequently unattended by inflammation.

remain healthy and sound through life, after the removal of considerable portions of their enamel, as for example, in those cases where they have been filed for the removal of caries which had attacked their lateral surfaces.

BALT. ED.

The former occurring in highly organized teeth, and the latter result in those teeth whose vital powers were constitutionally feeble. If these observations be correct, it must follow that to a very great extent experiments thus conducted, furnish us with definite information in respect to the chemical action of the substances tested upon living teeth. It is proper to observe however that any given substance by being mixed with the saliva in its different states, and with other substances will have its action modified, though not destroyed, unless it be neutralized by one having for it a chemical affinity. Not only so, but the strength of such affinity must be greater than *either* ingredient of the compound formed for *one* of the constituents of the teeth. For example, suppose tartaric acid in the mouth were met by potash, the action which it would otherwise have upon the teeth might be supposed to be suspended by its affinity for the potash. But even if these two ingredients to unite by simple affinity and as the result tartrate of potash fully formed, yet the effect upon the teeth would be the same in the end, for tartaric acid has a stronger affinity for the lime of the teeth, than for potash, hence by *elective* affinity it would leave its base, and produce its legitimate effect upon the teeth. This accounts for the well known fact that cream of tartar whitens the teeth, and the less known fact that it destroys them.

The idea then, that any substance which of itself is calculated to decompose the teeth, is rendered harmless by being mixed with many others, is not only false, but exceedingly mischievous in its consequences. Believing then that the result of these experiments furnishes us with information which is of practical utility, I shall give a brief summary of them, which may be embodied in the following propositions.

1st. Both vegetable and mineral acids act readily upon the bone and enamel of the teeth.

2d. Alkalies do not act upon the enamel of the teeth; the caustic potash, will readily destroy the bone by uniting with its animal matter.

3d. Salts whose acids have a stronger affinity for the lime of the tooth than for the basis with which they are combined, are decomposed, the acids acting upon the tooth.

4th. Vegetable substances have no effect upon the teeth till after fermentation takes place, but all of them capable of acetic fermentation act readily after this acid is formed.

5th. Animal substances even while in a state of confined putrefaction, act very tardily if at all upon either the bone or enamel. On examining the teeth subjected to such influence, the 20th day of the experiment, no visible phenomena were presented, except a slight deposit upon the surface of a greenish slimy matter, somewhat resembling the green tartar, often found upon teeth in the mouth.

To give a more definite idea of the deleterious agents to which the teeth are exposed, and their consequent liability to be affected by them, we will notice the effect produced by a few of the individual substances, which are more or less liable to be brought in contact with the teeth.

Acetic and citric acids, so corroded the enamel in forty-eight hours, that much of it was easily removed with the finger nail.

Acetic acid or common vinegar, is not only in common use as a condiment, but is formed in the mouth whenever substances liable to fermentation are suffered to remain about the teeth for any considerable length of time.

Citric acid or lemon juice, though less frequently brought in contact with the teeth, acts upon them still more readily.

Mallic acid or the acid of apples, in its concentrated state also acts promptly upon the teeth.

Muriatic, sulphuric and nitric acids, though largely diluted, soon decompose the teeth—these are in common use as tonics.

Sulphuric and nitric ethers have a similar deleterious effect, as also spirits of nitre—these are common diffusible stimulants in sickness.

The acids of some of the salts also corrode the teeth.

Super tartrate of potash as example, destroyed the enamel very readily—this article is frequently used to form an acidulated beverage.

Raisins so corroded the enamel in twenty-four hours that its surface presented the appearance and was of the consistency of chalk,—why?

Sugar had no effect till after acetous acid was formed, but

then the effect was the same as from this acid when directly applied.

This slight sketch will serve to give some idea of the exposure of the teeth to *external* destructive agents.

I have not included in this catalogue the septic acid, supposed by Dr. Mitchell to be freely generated in certain diseased states of the gums, and which according to his observations is a formidable enemy to the health of the teeth. Now the acid so frequently formed in the stomach in cases of bad digestion, and which is frequently thrown into the mouth in connection with half digested food, in the effort to relieve the stomach from painful tension.

Judging from the effects of this latter acid upon the throat and mouth, it is safe to conclude that it would act destructively upon the teeth. It is this, I have no doubt, which lays the foundation for that rapid destruction of the teeth which is so often observed in pregnancy, but which Mr. Koecker ascribes to a peculiar irritable state of the system.

I shall conclude this list of teeth destroyers by a brief allusion to the acid state of the saliva in certain diseases as given by M. Donna, of Paris, and reviewed by Dr. Johnson, in the *Medico Chirurgical Review*, vol. 1, for 1836.

Endorsed as this authority is by Dr. Johnson, it has the highest claims to our respect.

M. Donna assumes that the saliva in its normal state is uniformly alkaline.

This conclusion as shown by his quotations, is corroborated by several other distinguished physiologists.

The pathological condition of the stomach indicated by an acid state of the saliva, is irritation or inflammation of its mucous membrane, and as he contends, this condition of the stomach uniformly induces, or is accompanied by acidity of the saliva. Besides giving the result of his laborious experiments, in arriving at these conclusions he has narrated a large number of cases illustrative of the corresponding change from acidity to alkalinity as the patient recovered from the disease. In many cases he describes the effect of the saliva upon letmus paper as prompt as would be made by strong vinegar. If these observations are

correct, while they shew us the beautiful provisions of nature, in making the normal state of the saliva alkaline, thus constituting it in respect to the teeth, not only harmless, but an efficient protection against the acids so liable to be brought in contact with or generated about them, it points most clearly to the treatment best calculated to counteract their effects.

From this brief allusion to some of the external destructive agents which may singly or in combination act upon the teeth, we are led to wonder, not that we have so *much* disease from so *few* causes, but that we have so *little* from so *many* causes.

ARTICLE IV.

A remedy for the painful affection produced from cutting the lower dens sapientia or wisdom tooth, &c. Read before the American Society of Dental Surgeons, at its fourth Annual Meeting; Baltimore, July 20th, 1843. By J. S. GUNNEL, M. D.

HAVING seen several cases of severe inflammation of the gums and the other soft parts surrounding the under wisdom teeth or dens sapientia, at the time of cutting those teeth; soon after I commenced the practice of dentistry (about 1820, and having also been a great sufferer in that way myself previously to my studying medicine,) I was led to seek a remedy for that painful affection; this inflammation is sometimes so great as to produce extreme pain at the junction of the jaws, and so much swelling and soreness of the surrounding soft parts (and extending to the throat) that the patient is hardly able to open the mouth, so as to give the physician an opportunity of even seeing the parts affected.

In such extreme cases I have used the depleting remedies both general and local with good effect; but my object at present is to show how to prevent such cases or their recurrence, by pointing out their causes and applying the remedy in time.

The cause of this painful affection when in its extreme cases, arises generally from the upper wisdom tooth having cut through the gum first (before the under wisdom tooth of the same side) and passing so low down as to rest on the lower gum, before the

under wisdom tooth begins to cut through the gum; the upper wisdom tooth in some cases being from an eighth to a fourth of an inch lower (or longer) at its cutting (or grinding) point than the molares that is next to it; now it will be readily perceived, that the first move of the lower wisdom tooth to cut through the gum (or any food or other substance pressing thereon or the cheek or soft parts folding over or between the teeth) will produce irritation and inflammation which is aggravated by pressing the jaws together, and when the soft surrounding parts are once swelled they will frequently press forward over the jaws or tooth, so as to be pressed on when the mouth is closed, thus continually irritating the inflamed parts.

In some cases I have cut off the whole of the gum covering the top of the under tooth, with great advantage; but occasionally the tooth is so very far back, that the flesh back of the tooth and at the side, will press over the under tooth, and still continue to be pressed upon or mashed, when the jaw closes, so as to produce great inflammation of the surrounding parts, extending to the throat, and in some cases accompanied with great stiffness of the joint of the jaw. In all such cases as above, the upper wisdom tooth should be extracted as soon as possible, and the cure will soon be completed and the recurrence ever after prevented, and the under tooth be freed from difficulty in arriving at its proper situation.

The above plan of cure I would recommend with great confidence, as I have seen a number of persons that had been occasionally sufferers for years, from the above affection, though they had been attended by some of the best physicians and dentists in this country, and some in Europe, one gentleman an European told me that his case had cost two hundred dollars in physician's fees, and a loss of business of at least a thousand dollars. This case as well as others was readily cured by extracting the upper wisdom tooth, and the use of some mild astringent and mucilaginous wash for the inflamed parts. In those cases the upper wisdom teeth are located so very far back as not to be considered a loss from extraction.

ARTICLE V.

Contributions to Operative and Mechanical Dentistry. By W. H. ELLIOT, Member of the American Society of Dental Surgeons.

No. 2.

ON EXTRACTING THE TEETH.

THIS important operation, at once the most simple, the most difficult, yet the most common, performed alike by the accomplished surgeon and the veriest quack, alternately baffling the efforts of the one and yielding to those of the other, is too often regarded with indifference, or looked upon as one of the evils attendant upon the practice of the profession. Nor can it be denied that even in the present age, either for the lack of suitable instruments, or the want of skill in the use of them, there exists, with some members of the profession, a strong aversion to it; for we not unfrequently meet with proof that their patients are sent away with a miserable palliative, or a mere apology for a remedy, when a single well directed effort would have rid them of a painful disease. He who is so weak as to shrink from the performance of this operation when the welfare of his patient demands it, is unfit to do it when it becomes precursory to others more lucrative yet less difficult; for in the most simple cases it requires the nicest skill and judgment, that he may give the patient the slightest possible pain, and that no avoidable injury be done to the surrounding parts.

Where then shall we look for a remedy? It can only be found in a thorough knowledge of the physiology and pathology of the dental organs, and in a multiplication of the simplest yet most effectual means, with a perfect knowledge of the use of them. The operator should have entire confidence in himself and in his instruments, so that he may be able to use them without hesitation, let the condition of the tooth be what it may. Under such circumstances he will do credit to himself and honour to the profession.

There is no operation in dental surgery that secures to the practitioner more effectually the full confidence of the patient, than the successful removal of a troublesome tooth.

There are few among us who are not aware that when it becomes necessary to extract a large number of decayed teeth or stumps, if the patient suffer the loss even of the most trivial by gentle means, he is sure to meet with no further opposition to his wishes; his gentlemanly deportment, his regard for the feelings of his patient, the delicate touch of the instrument, the ease with which he seems to perform the operation, and, finally, the successful removal of the tooth, with less than anticipated pain to the patient, all conspire to raise his fortitude to a confident degree, which places him unreservedly in the hands of the operator.

In the following remarks, I only wish to be understood as giving my own views, and not that the particular instruments and methods which I recommend are the only correct ones.

The Key.—Although I seldom use the key myself, and never except in those cases where the tooth has not sufficient strength on both sides to sustain the pressure of the forceps, it may not be out of place here, to make a few remarks on the best method of applying that instrument.

I would say, as a general thing, that all teeth should be turned towards the tongue; but this is sometimes impracticable. If the anterior portion of the tooth be too much weakened to bear the pressure of the hook, or if the space between it and the adjoining teeth be too narrow to allow its passage into the mouth, the other method may be adopted. The strength and position of the tooth, as well as the condition of the surrounding parts, should, before any particular method be decided upon, be well considered. This the operator must learn to do, if possible, at a single glance, lest a close and protracted examination alarm the patient.

There are several reasons why the fulcrum should not be placed on the outer gum. In the first place, the external gum being less often brought in contact with food or other foreign substances taken into the mouth, even when free from inflammation, is more highly sensitive to the touch of the instrument.

Secondly.—The internal alveolar plate of the lower jaw particularly, being thinner and consequently more elastic, will allow the tooth sufficient lateral motion to destroy its attachment on the opposite side, before the tooth begins to rise from the socket, and on that account it does not require half the vertical force to finish

the operation that it would if the inner plate were stiff and unyielding, for in that case the whole periosteum must of necessity be torn asunder at the same instant. This remark applies more forcibly to the molares.

And lastly, the form especially of the lower teeth is more favourable to their internal exit.

One great reason why writers have generally recommended the application of the fulcrum to the outside of the lower jaw, is, because of its liability to slip when applied upon an internal gum which recedes.

For the benefit of those who still persist in the use of the key on all occasions, I will mention a slight improvement that I have made which secures the instrument effectually against the accident of slipping from its first position. This is the application of a second hook, to Dr. Parmly's improved key, the only one that can be used with any degree of safety. The improvement in question, is a broad thin hook fitted to the crowns of the teeth, having upon it a round screw shank, which passes through the head of the pivot, upon which the fulcrum turns. This hook when in use may hang upon the adjoining or second tooth removed on either side of the one to be extracted. By means of the screw on the shank, the fulcrum may be raised or lowered as occasion may require, in case of the absence of both teeth on either side, the hook may be drawn down by the same means, so as to rest firmly on the gum. This hook, instead of making the instrument more difficult of application, assists the operator very much in placing and holding it in a proper position until the first hook be adjusted.

The fulcrum should not, as has been recommended, be fixed upon a line with the edge of the gum, but rather be placed with so much of its face upon the gum, that it will not come in contact with the tooth. When it does come in contact with the tooth, the instrument at once loses a great portion of its power to elevate. It does so equally with or without the second hook.

That the advantage of having the fulcrum held firmly in its place is very great, is proven by the fact, that I have never in a single instance, to my knowledge, fractured the alveolus in the slightest degree, when the second hook had been used ; indeed it

would be almost impossible to carry away that portion of the alveolus which is firmly held down by the fulcrum.

The even and firm basis offered to the fulcrum by the internal gum of the upper jaw, needs no argument to establish its claim of superiority to that of the external.

I cannot agree with Dr. Shepherd in his opinion that he who has the ability to use the key successfully, ought not to change it for any other instrument; nor with Dr. Thackston, that the key should be abandoned entirely. The latter gentleman, in his letter* proves clearly enough that the fulcrum must rest upon the gum, in his supposed case, but unfortunately for his argument against the key, he stopped short of telling us how that operation might be performed with the forceps.

There is among several instruments that I have invented and constructed for the purpose of extracting teeth, one which I use with perfect success, and which I believe deserving of some consideration. It is a combination of the key and forceps; having upon it the beaks of forceps, and the handle of a common key instrument; and is so constructed that when power is applied to the handle, the beaks grasps the tooth with just sufficient force to prevent them from slipping, be that power much or little. The position of the handle of this instrument is always such that the operator is able to use his whole force upon it without the least inconvenience. Its lateral force is equal to that of the key, and its vertical, equals that of the forceps.

The Forceps.—The next instrument that seems to claim our attention is the forceps.

The first object to be secured after fitting accurately the beaks of the forceps to the necks of the teeth, for which they are intended, is to bend the handles into such a form that during the operation, the operator's hand, arm and chest, may be in that position in which he can exert his utmost strength if occasion require without the least awkwardness or inconvenience.

In the removal of all teeth with the exception of those having roots that admit of a rotary movement, the instrument should have two lateral motions, first inward and then outward, and that

* Journal, page 185, vol. 1st.

with an effort so determined, that were its attachment twice as strong as it usually is, the operation would be performed in precisely the same length of time. These motions should not be made so rapidly as to prevent the operator from observing with precision the result of each effort to loosen the tooth, or cause him to forget that it is always liable to crush under the pressure of the forceps. In case one side of a tooth be very much weakened by decay, the instrument should have but one lateral motion, and that towards the weaker side.

The vertical force should always commence with the lateral, and increase until the tooth leaves the jaw; if on the contrary the tooth be carried from side to side before the vertical force be applied to it, all that pain which is occasioned by forcing one prong into the jaw, is unnecessary, for although the periosteum may be partially crushed, its attachment to the jaw is not the less strong.

The strongest of all forms that forceps possibly can take is that of the hawk's-bill, therefore just in proportion as they approach this form, they may be made lighter and stronger, it is on that account for extracting the lower molares that I prefer the forceps as improved by Dr. Flagg to those recommended by Mr. Snell. Besides, the position of the hand while operating with Flagg's forceps is much more natural. For extracting the lower dentes sapientiæ and bicuspidæ, I use the same form of instrument with the exception that the beaks of those for drawing the posterior teeth have a little more curvature, and those for the anterior a little less.

In removing teeth from the right side of the lower jaw, the operator's first finger and thumb should be next to the joints of the instrument, but in drawing them from the left side, the little finger should be next to the joints.

Whether operating upon the right or left side of the jaw, the position of the operator should be the same, that is, with the head of the patient resting against his left breast, and supported in its position by his left arm, the chin being secured by his left hand.

For extracting the molares, dentes sapientiæ and bicuspidæ from the upper jaw, I use instruments differing in their form from any that I have ever seen in use by others. This difference consists in giving to the instruments recommended by Mr. Snell, a

bend between the handles and joints, exactly opposite to that between the joints and beaks, so that those for drawing the dentes sapientiæ, present two angles of about forty-five degrees each, one at each extremity of the joints; those intended for the molares are bent to angles of about thirty-five degrees, and those for bicuspidæ to angles of about twenty-five.

Owing to the handles and beaks being bent in different directions, the instrument is as well balanced, as if it had no angles whatever in it. A line drawn from the points of the beaks to the extremity of the handles, passes through the centre of the joint. This form of instrument enables the operator to extract a dens sapientiæ with the same facility and in the same manner, as if it were situated in the anterior part of the mouth.

As the force is applied longitudinally with the handles, one of them should be bent in the form of a hook, to prevent the hand from slipping.

The Screw.—The screw when properly made and skilfully managed, is of all instruments the least productive of pain.

Every dentist should supply himself with screws of different sizes, each screw being accompanied with a tap and drill. The tap and screw should, like the drill, be a separate piece from the rest of the instrument, so that others differing in size and length, may be put into the same handle. The threads should be fine, and formed like those of a common wood-screw, thin and sharp with a broad and deep space between them.

The screw and tap should be made exactly alike, with the exception that the tap should have deep longitudinal grooves filed upon it. These grooves should be cut deeper than the threads so that the tap may serve as a broach, at the same time that it cuts the thread in the root.

The results of numerous experiments upon the screw, have led me to believe that its success, almost entirely depends upon its form, and upon the form of the hole in the root into which the screw is inserted.

The form of the screw should be slightly tapering, equal to an angle of five degrees; when made to taper more, it requires too much force to give the screw a hold upon the tooth; when made to taper less, the tap cannot be withdrawn, without doing more or less injury to the thread which it has cut in the root.

The hole in the fang should have the same diameter within as at its orifice, leaving it to the tap to give it the proper form to receive the screw.

For the roots of posterior teeth, the drilling instrument should have upon it an universal joint, with a support to hold it at any required angle. For tapping and extracting such stumps, the instruments into which the taps and screws are placed for use, should like the drilling instrument, have an universal joint upon it, of sufficient strength to raise the fang from the jaw, it should also have a movable fulcrum so arranged, as to be placed on the top of any of the neighbouring teeth. This fulcrum of course cannot be used in the absence of the joint, nor is it required, except when the position of the tooth makes the joint equally necessary.

The teeth upon which the fulcrum rests, should always be protected by a slip of soft pine wood.

I sometimes extract the root of the upper front teeth by striking them out at a single blow. For this purpose I attach to the screw a rod about sixteen inches in length, made of steel wire, upon which I place a leaden weight of about three pounds, then when the screw is firmly fixed in the root, I slide the weight against a button on the end of the rod, with sufficient force to effect the object.

I have been positively assured by persons for whom I have drawn teeth in this manner, that the operation gave them no pain whatever.*

* The writer thinks that his first article has not been *fairly* treated in the appended note.

In regard to the originality of his views as to the form the cavity should take, *par preference*, "smaller within than at the orifice," he believes he stands unsupported by a single previous writer.

The annotator says—"there are few dentists, who have much experience, who are not aware of the necessity of making the cavity the same or nearly the same size at the orifice as at the bottom," and refers to Bell and Harris, also Parmly's introductory address, in No. 1, vol. iii.

What the writer contends is, that to him belongs the *novelty* of making in the generality of cases, the cavities of a shape *exactly reversed* of those recommended by most of the best and later writers on operations on the teeth, and subjoins extracts bearing him out from the writers quoted by the anno-

tator.* By reference to which it will be seen by every unprejudiced eye, that those dentists of experience do not, as is misstated by the annotator, make the cavities the same or nearly the same size at the orifice as at the bottom ;" but recommend them to be *larger* as stated by the writer.

In regard to the opinions of "dentists who have much experience," for them he entertains a becoming respect ; but regarding error as the result of "*experientia fallax*" and believing that "*experientia stultorum magistra*," he cannot yield up a tested proof nearly because it conflicts with preconceived notions, or wars against prevalent practices. There were few philosophers of experience before the days of Galileo, but what regarded the earth as the centre around which the sun revolved ; yet the Copernican system has proved the only true one, the opinion of the papal court to the contrary notwithstanding, nor have we many enlightened dentists at the present time who would advocate their own rude mechanical contrivances of sea-horse plates, animal teeth, &c. in use *a dozen years ago*, merely because they were sanctioned by experience. Such a praxis of reasoning is as puerile as illogical.

In his numbers the writer shall advance nothing that will not stand the test of proof ; and whilst he invites criticism, he asks in all fairness, that it will be conducted in a spirit of inquiry, and that his own views may not be misstated and the writings of others opposed to them misquoted, and be made to say what they have not charged themselves with in print.

It becomes not the writer to speak immodestly of his own experience in dental surgery, but he may be permitted to say, if an extensive practice can add ought to his knowledge, he is fortunate in having such a one. His object in writing these numbers is not so much to extend his own fame, as to make known in liberality and good feeling towards his professional brethren, what he deems to be improvements in dental practice, and the manufacture of instruments ; yet he may be indulged in a laudable ambition to improve his profession without subjecting himself to unfair statements of his views, and misapprehension of his intentions.

* "The cavity to be filled should be rather narrow in proportion to its depth, and if practicable, should be made rather larger within than at its external orifice."—BELL, 142.

"The bottom of the cavity should always be a *little larger* than the top, or at least as large."—HARRIS, 157.

"It is essential in all cases that the cavity which receives the gold should be made *larger within*, than at the orifice or external opening."—PARRELY's introductory address, No. 1, vol. iii.

The injustice of which Mr. Elliot complains as having been done him by the author of the note to his former communication, in the expression of the belief that he was in error with regard to "the originality of his views, on the best form the cavity" in a tooth, preparatory to filling, should have, we are certain was not intended. The writer of the note in question, says—

"There are few dentists who have much experience, who are not aware of the necessity of making the cavity the same or *nearly* the same size at the orifice as at the bottom;" while Mr. E. states, "that in, by far the greater number of cases, they (the cavity) should be made quite as large in circumference at the orifice, as at any other part, and in very many cases larger." The views of the authors referred to by the former, as may be seen by the quotations made from them by the latter, we think, sustains the opinion expressed by him upon the subject. The only material difference of opinion then between the writer of the note and Mr. E. is, that the latter claims to be the first to have recommended that the cavity in a tooth to be filled, should never be larger interiorly than it is at the opening, and that in very many cases it should not be as large; while the former contends that the majority of experienced practitioners would have the orifice and bottom of the cavity of the "same or *nearly* of the same size."

As to the supposable advantage for which Mr. Elliot contends, of having the cavity in any case larger at the opening than within, we differ with him in opinion. If the gold, or material employed, whatever it may be, for filling the tooth, be packed with no other instruments than the common round-pointed pluggers, it could be more thoroughly done, we admit, in a cavity thus shaped, than in one as large or larger at the bottom than at the orifice; but if properly constructed wedge-pointed pluggers be used, and they are the only instruments by which a filling can be thoroughly condensed, it may be more firmly packed in a cavity as large or even a little larger within than at the opening, than in one of a reversed shape, for the plain and simple reason, that in the latter case, the pressure employed to force the foil out against the walls of the cavity, would displace it from the tooth, and thus defeat the object intended to be accomplished.—*Balt. Ed.*]

ARTICLE VI.

Alveolar Exostosis. By S. M. SHEPHERD, D. D. S. of Petersburg, Va.

Mrs. H. a lady residing in this town, about twenty-five years of age, and whose health has been uniformly good, called on me about three months ago, saying that she had "something growing in her mouth," which gave her no pain, but from the size which it had attained, was a considerable annoyance. Upon examination I found that the first inferior molar tooth of the right side had been removed by decay, and there was a growth of flesh occupying the entire space. This flesh had risen up even with the

grinding surfaces of the teeth, and I suppose would have been much higher if the teeth above had not met upon it and kept it down. It had also spread out on each side something like half an inch, so that the outer portion gave the jaw precisely the appearance of a badly swollen gum from tooth-ache.

Upon inquiry I learned that it had been in progress about three years, during which time it had acquired great solidity. Pressure upon it with the end of the finger was very similar to that of a child's gum over a molar tooth just before its eruption. Its immediate removal was determined upon. Owing to the situation and size of the excrescence, I thought it best to divide it in the centre, and upon a line with the alveolar ridge. This I did with a common gum-lancet without meeting with any obstruction. I then attempted to cut away the inner portion, when to my surprise, the instrument after passing through the surface met a firm resistance—so that it required a considerable effort with a strong blade of a knife to divide it from the alveolus. This substance proved to be a new growth of bone, quite cellular in its structure, and resembled the inner portion of the vertebra. This bone grew up from each edge of the alveolus in two distinct portions—each one being about the size and shape of a pea; which fact I ascertained by removing the flesh or skin from one of them which I preserved in alcohol. After removing the excrescence I searched in vain for the roots of the tooth which I suppose produced it; the entire destruction of which must have been completed previous to the excision.

The operation was followed by considerable hemorrhage, but was not attended with much pain. The fleshy portion of the protuberance being perfectly insensible. By this simple operation, a perfect cure was soon effected.

ARTICLE VII.

Irregularity of the Superior Denture. Treated by the JUNIOR EDITOR.

THE patient was a healthy, well grown boy of 15 years. The position of his teeth, at his first visit to me, will best be understood by referring to this engraving.



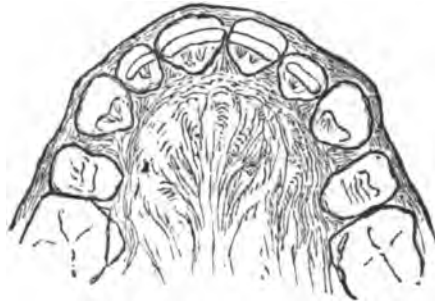
As no notes were taken during the treatment, I am unable to give the time required for each step of the cure. I saw the patient every few days, and made the applications herein described, as changes in the positions of the teeth indicated their propriety. On the 7th of September, I extracted both the first superior bicuspidates, and directed the patient to return as soon as the inflammation consequent upon this operation should have slightly subsided. Having met with an accident, he did not return for several weeks. At the next visit, I passed an elastic thread, (made of sewing thread and gum-elastic,) around behind the first molar and before the cuspidatus of one side; the two ends of the thread were then tied tightly, and the corresponding teeth of the other side were treated in like manner. These threads were several times renewed as shorter ones became necessary. As both sides were treated alike it will be sufficient to particularize the treatment of but one of them. Having drawn the cuspidatus about one line back, thread was now passed between the bicuspid and first molar; then the end towards the cheek was passed between the first and second molares; this gave both ends toward the palate; then both ends were brought forward and tied tightly before the cuspi-

datus, thus changing the direction of the force by making the bicuspid serve as a pulley. But this pulley would serve as such but a short time, becoming, itself, loose in a few days. I then let the threads of both sides remain to keep the cuspidati from returning while the parts adjacent to them were allowed to rest a few days and recover from some slight soreness, and directed the treatment to the incisores.

A slip of gum-elastic was placed between each lateral incisor and its adjoining central, which separated the teeth at these places about half a line. A stick of hickory pivoting was then split in two, and cut of the right length to reach from the depression in the back of one lateral incisor to that in the other. This was cut away toward each end so as to form a spring, thickest in the middle, where a non-elastic thread was tied fast. This spring was placed against the backs of the lateral incisores and held there by the patient pressing forcibly against its middle, while both ends of the thread were brought forward between the central incisores and tied tightly over a thin stick two lines long of the same wood, laid across the space between the centrals. This carried the lateral incisores forward and outward, while it slightly obtunded the angle formed by the centrals. This last effect was sufficiently produced afterward by applying a like spring, in like manner, except that its ends rested upon the backs of the central incisores, at those parts nearest to the laterals.

A like spring of hickory was now applied to bring the cuspidatus of each side toward the palate, by having one end rest upon the palatine side of the first molar, and the other upon the back of the lateral incisor. This brought the latter to its place, but the cuspidatus was still a little too prominent. One end of a non-elastic thread was now passed between one lateral incisor and its adjoining cuspidatus—through to the front between this lateral and its adjoining central—across the front of both centrals—through between the other lateral and its adjoining central—through to the front next the other cuspidatus, and there tied across the front of all the incisores, moderately tight, to the other end. This kept the incisores from change of position while the elastic thread was again applied to the cuspidati, using the bicuspidés as pulleys as before. This brought the cuspidati into place, and the teeth

were then regular. Non-elastic threads were now applied to the cuspidati, in the same manner as those they superseded, and these and the one upon the incisores were kept upon the teeth two or three weeks and then removed. After a week or two one of the lateral incisores was found to be a little within its proper place. A tooth immediately under it, in the inferior denture, being found to be also within its proper arch, was brought to the front by the application of means similar to those detailed; and being held there a few days brought the upper one to its proper position by pressure upon its back. After a few days wearing the thread upon the under teeth, it was removed and the cure was completed, as represented in this engraving:—the treatment having lasted, (including lost time,) some four or five months.



It will be seen from this account that no metallic bars, frames, blocks, hooks or springs, in fact, no metal or anything of like rigidity was used. The patient attended to his studies and other duties as he would have done without the treatment; suffering little if any pain, and but slight inconvenience. Probably much less time would have been required for the operation, but for the accident which delayed it at the commencement. M.

Washington, Aug. 10th, 1843.

Collectanea.

CURE OF ABSCESS OF THE TOOTH.

*To the Editor of the Lancet :—*SIR.—In the *Lancet* of Dec. 3, 1842, page 99, you published an article upon “intra-dental abscess,” with remarks on the “use of a vent in the stopping of decayed teeth.” As I am of opinion that you would wish to correct error on the subject, I have thought that a communication from this side of the Atlantic would not prove unacceptable. Your valuable publication being now republished here by one of our most enterprising firms, that of Messrs. Wilson and Co. many persons in America have the advantage of perusing its columns, and thus the above article came under my notice, when perceiving at once the palpable mistake that it contains, I determined to explain the unsoundness of the theory, and the uselessness of putting in practice the propositions therein named.

Mr. Saunders (the author of the paper) says, that when the internal cavity of a tooth is suddenly exposed (the nerve and its membrane, of course, is to be understood) by the breaking down of the thin layer of carious bone which protected it, by “injudiciously” stopping it, inflammation and supuration speedily supervene. He afterwards proposes, in order to obviate the difficulty of intra-dental abscess, to plug up the cavity in the tooth, and drill a hole through the “stopping” so as to reach into the *cavitas pulpæ*, and thus form “a little canal” as an outlet for the pus secreted therein, as well as for the tooth’s pent-up nervous irritability. The theory is ingenious, but the practice unfortunately does not preserve the tooth, nor will protect its owner from tooth-ache.

Mr. Ghrimes, in the *Lancet* of Dec. 17, 1842, satisfactorily proves the mechanical uselessness of the “little canal,” but unfortunately offers, as an amendment to the method proposed by Mr. S. a proposition which is worse than useless, namely, that of drilling a hole from the neck of the tooth, through its substance, into the internal cavity, to answer as a substitute for the little “canal of Saunders.” This also has the same objection, that it will not prevent or arrest the decaying of the tooth, nor prevent its aching, while, in addition, it would allow the decay to undermine the stopping, so that perchance the patient would one day discover that with his meal he had swallowed the crown of his tooth, leaving the “stump” in its place. It is dangerous to the tooth to meddle with its neck in any way. Ample proof of this fact is offered in the serious injury done to sound teeth, where clasps, wires, or ligatures are applied around their necks to secure artificial teeth, the baneful practice of some dentists. The neck of the tooth, externally, is its most tender and vital part.

Mr. Saunders candidly admits that his practice does not effect a cure; nor did he attempt it, believing it to be, as he says, "impossible, at least in the present state of dental surgery," to arrest the suppurative process when once established "under such circumstances and in such a situation." With all due deference to Mr. Saunders' experience, and his opinions of "the present state of dental surgery," I beg to state that not only an arrest, but also a perfect cure, may and can be effected, and the tooth effectually stopped, and rendered useful for life. The following formula.

R Ox. arsen. alb, 120th gr.;

Pulv. gall. $\frac{1}{4}$ gr.;

Opii, gr. ss;

made into a paste, and applied into the cavity of the tooth, and kept there either by a softened piece of wax, or a pledget of lint saturated with kreosote, will entirely remove it, in one application. All that is necessary afterwards, for two or three days, is to apply a little dry sulphate of lime, introduced into the tooth to absorb the little corruption left there. The tooth may then be sponged out with eau de Cologne, and filled or stopped, either with gold foil or a paste composed of marmora and silica. I have followed this practice for fourteen years, and with the exception of two cases within that time I have never failed to eradicate the disease, and effect a perfect and permanent cure. I remain, sir, your most obedient servant,

New York, Feb. 25, 1843.

A. C. CASTLE, M. D. *Dentist*.

[London Lancet.

DENTAL ABSCESS.—FASTENING.

To the Editor:—Sir,—I feel indebted to Mr. Castle, of New York, for his account of the treatment that he recommends for the cure of abscess in the tooth. That gentleman, however, should have remembered that I did not offer my method as a *cure*, but, at the best, only as a palliative; and the circumstance of my stating a case which had been successful for about two years, seems entirely to have escaped his notice. The discussion of this subject, however, having been the means of bringing forward a *cure*, I would solicit your attention to another point. Mr. Castle, as an objection to my method, remarks, that the danger of meddling with the neck of a tooth, in any way, is amply shown by "the serious injury done to sound teeth, where clasps, wires, or ligatures are applied around their necks, to secure artificial teeth, the baneful practice of some dentists." Although the mechanical part of the dental profession has been brought to a very high state of perfection, still, sir, I have yet to learn a plan by which artificial teeth can be supplied without recourse to the means of attaching them to others, when there are any remaining, (I allude to the *generality* of cases.) That such can be avoided is commonly asserted by advertisers, but these very men, in most cases, having but little knowledge of their profession, eventually use them, to the detriment of the other teeth. If the clasp be properly adjusted

to the adjoining teeth, and its pressure be equally applied upon that part of the surface which it covers, it will *not* be injurious. This assertion of Mr. Castle not being attributable to the same motive as our London *professors*, and Mr. C. having shown his wish to disseminate information, he would, I am sure, confer a favour upon the profession generally, if he favoured us with an explanation of his system of accomplishing this desideratum in London practice. I am, sir, your obedient servant,

SAMUEL GHEIMES, *Dentist*.

[London Lancet.

Baker st. March 29, 1843.

Staphyloraphy.—The *Dublin Journal of Medical Science*, for January last, contains an account of three cases, in which the operation for uniting the cloven soft palate was performed successfully. The operator in the first case was Dr. Cusack, surgeon to Stevens' Hospital, in the two others Sir P. Crampton. Dr. Cusack's patient was a medical student, eighteen years of age, labouring under a congenital fissure of the soft palate. For some time previous to the operation he was directed to employ measures to diminish the irritability of the fauces, the existence of which constitutes one of the principal difficulties, and in the removal of which he was perfectly successful.

Dr. Cusack proceeded as follows:—With the aid of a simple forceps and curved needles, three ligatures were passed at equal distances from each other through the soft palate, the lowest being at the base of the uvula; a double-edged knife was then introduced about a line from the margin of the cleft, and the same distance from the apex of the triangle; on each side in succession, the incisions being terminated above. After the lapse of a short time, during which the patient took some light nourishment, the edges of the wound were approximated, and the ligatures tied with a surgical knot; one of them, however, having been cut, as it was suppose, too closely, unravelled, and was replaced. Some slight hæmorrhage followed, with teasing cough, and a few hours after the operation all the ligatures had become unravelled, and were, of necessity, replaced by two others at points more remote from the margins of the fissure. They were each secured by a simple knot. No untoward symptoms occurred afterwards, and on the fifth day the ligatures were cut, the palate being perfect, the only remaining defect being a bifid uvula, a condition commonly met with in persons who articulate with perfect distinctness.

Sir Philip Crampton's patients were a boy of twelve years of age and a young lady aged sixteen. The peculiarity in the treatment of these cases consisted, first, in the manner of securing the ligature; and secondly, in the management of the patient after the operation. The difficulty of tying the second knot on the ligature, without suffering the first to become opened by the strong retraction of the edges of the fissure effected by the muscles of the palate, has always been acknowledged. This difficulty, however, was effectually removed by an ingenious contrivance of Mr. Maclean's; after

the ligatures had been passed through the palate at the distance of a quarter of an inch from the cut edge of the fissure, and brought out at the mouth, their ends were passed through a small perforated metallic bead, such as are used in making purses; the bead was then pushed down along the ligatures, closing them as it descended, until it touched the approximated edges of the wound; it was then compressed with a pair of strong, blunt-pointed forceps, and the ligatures were thus firmly secured without a knot at the required degree of tension. The other and most important peculiarity in the treatment consisted in allowing the patients an ample supply of soft food during the whole period of the treatment. Boiled bread and milk, custard, soup, and jelly, were given twice or thrice a day, and the patients were not confined to their beds, Sir Philip Crampton conceiving that the total privation of all nourishment for five days, so strongly insisted on by Roux, was not only unnecessary, but in the highest degree unfavourable to the successful issue of the operation, as it must cause a state of constitutional disturbance highly unfavourable to the establishing of the healthy process of union by the first intention, in proof of which the observations of Messrs. Manoury and Thore, house-pupils at the Hotel-Dieu, where Roux's operations were performed, are quoted; they state that they have seen delirium and severe nervous derangement follow such protracted abstinence from food.—*Prov. Med. Jour.* March 25, 1843.—*Am. Jour. of Med. Sciences.*

Elongated Uvula and Enlarged Tonsils.—James Yearsley, Esq. a London surgeon, somewhat distinguished for his researches into the causes of deafness, has produced a treatise on *Elongated Uvula and Enlarged Tonsils*, which develops some important views. He points out the intimate connection between certain morbid conditions of the throat and ear, says the editor of the London Sun, and several imperfections of the voice and speech. Mr. Yearsley has established that when those parts are in a state of active inflammation, they may be excised with safety and even advantage, as there is scarcely any hæmorrhage. It is advisable, therefore, even in cases where it seems to be hazardous to perform the operation, not to hesitate a single moment, when the condition of the patient is at all endangered by the delay. Mr. Yearsley conceives that a relaxation of the mucous membrane of the throat and elongation of the uvula, give rise to symptoms which indicate a pulmonary consumption. An incessant irritation produced by an elongated, pendulous uvula, produces cough, and, if long continued, may develop a disease of the lungs, especially in persons hereditarily disposed to that malady. The voice of singers is singularly influenced by the uvula; if too long, the character of the voice is immediately improved by snipping it off. Practitioners should look to that little appendage often, since it may give rise to a multitude of formidable affections that might be removed instantly with a pair of scissors.—*Boston Med. and Surg. Jour.*

Stammering.—Dr. ABERCROMBIE read a paper on this subject to the Medico-Chirurgical Society of Edinburgh in January last. When his attention was first directed to the subject, he stated, the following facts attracted his notice :—

I. He observed that stammerers never stammer in *singing*.

II. The individual on whom his first observations were made, did not stammer when he was obliged to speak in a louder tone of voice than usual, as when conversing in the midst of a noisy crowd, or in a carriage on a rough road.

III. The precentor of a church came under his notice who stammered in common conversation, but showed no hesitation when *reading out the line*, as it is called, which was done in a peculiar high-pitched tone of voice, such as is usually employed by precentors for that purpose.

IV. He found that stammerers have no difficulty in performing any of those movements of the lips and the tongue, by means of which the consonant sounds are produced, when they are directed to make these movements simply, that is, without any reference to speech.

V. He observed, that in some stammerers, the difficulty is not confined to the consonant sounds, in which the peculiar action of the organs of speech is more directly exerted, but extends to other sounds, in which these organs are little, if at all concerned, such as the simple aspirated *h*, as in the words *happiness, holiness, &c.* In one individual, indeed, who was treated successfully, he found that he often hesitated at such words as these, long after he had overcome every difficulty respecting the consonants.

By such facts as these he was led to the conjecture, that the affection does not depend upon any defect in the organs of speech, properly so called; but is rather connected with a deficiency in the management of the voice; and he thought it would be found, that, when a stammerer gets into that peculiar state of hesitation, which is so familiar to every one who has witnessed it, he is endeavouring to speak when *he has no voice*; that is, when the lungs have become emptied of air, or nearly so.

According to these views, the principles on which the cure of the affection may be accomplished, appeared to be the following: In actually accomplishing a cure, every thing depends upon the perseverance of the patient himself after the principles have been explained to him.

I. To direct the attention of the individual to the three distinct parts, of which the function of speech consists, viz.

1. A full and continuous current of *air* proceeding outwards from the lungs.

2. The formation of this into *inarticulate sound, or voice*, by the action of the larynx.

3. The formation of this into *articulate sound, or speech*, chiefly by certain movements of the *lips* and the *tongue*.

He soon perceives that he has no difficulty in performing any of these actions, when they are thus made separate objects of attention; and in this manner he is led to understand that his affection does not depend upon any

defect in any of the organs of speech, or a difficulty of performing any of the processes of which the function consists; but in a certain want of harmony among these processes, which has grown into a habit. He is easily made to perceive, for example, that he has no difficulty in performing that motion of the lips by which is formed the sound of the letter *b*, then why should he have any difficulty in saying *bee, boy, bell*, &c. When the formation of each letter is thus made a separate object of attention, or a distinct voluntary act, it is remarkable to observe how the difficulty seems to vanish; and by continued attention in this manner, the habit is gradually broken, in as far as concerns this part of the process.

II. The second, and principal part of the treatment is, to exercise the individual in the habit of never attempting to speak without having a **FULL AND STRONG CURRENT OF VOICE**. He may be made sensible of the effect of this, by making him read in a strong loud tone of voice, as if he were calling to a person at a distance,—or in a tone resembling singing or chanting,—or in the peculiar tone of a precentor, in reading out the line, which has been already referred to. When he has thus been made to understand the principles on which the removal of the affection is to be conducted, the farther treatment consists in a course of exercises calculated to give him a full command of his voice, and so to correct the habit which he has acquired, of speaking, or attempting to speak, without sufficient voice. For this purpose he should be made to read aloud, several times a-day, from an author whose style is somewhat declamatory. In doing so, he should be made to read in a high-pitched tone, and to stop frequently and take a full breath, so as to have the voice thrown out with a force beyond what is required for ordinary reading or ordinary conversation. With this view it is necessary to make him stop and take a full inspiration much more frequently than would be required by another person; for it is in this part of the process that we are to trace, in a great measure, the bad habit which he has acquired, and the opposite habit which he is required to cultivate. In particular, whenever he feels the tendency to hesitate at a word, he is to be taught to stop instantly, take a full breath, and then try it again. He will be immediately sensible of the effect; and a succession of voluntary efforts of this kind will be gradually formed into a habit, calculated to correct the injurious habit, in which, I believe, we are chiefly to trace the pathology of stammering.

In a note appended to this paper, Dr. Abercrombie remarked, that since his observations were written, he had found that the same principle, respecting the influence of respiration in this affection, had been pointed out by Dr. M'Cormack of Belfast, in a small volume published in 1828.—*London and Ed. M. J. Med. Sci.* March, 1843.—*Am. Jour. of Med. Sciences.*

Science of Meteorology.—A highly complimentary notice of Dr. Forry's late work on meteorology, by the celebrated philosopher Humboldt, has been published. It appears he regretted that he could not employ for his

comparisons of Asiatic climatology with the American, Dr. Forry's judicious researches on the climate of the United States and its endemic influences. A variety of approbatory remarks have also appeared from elevated sources in this country; which must be gratifying to an author, since it is so often the case that a prophet has but little reputation at home.—*Boston Med. and Surg. Jour.*

Regeneration of the Teeth after Caries of the Upper Jaw-Bone.—A boy, eleven years old, was, after the suppression of tinea, affected with a painful swelling of the upper jaw-bone of the right side; the teeth became loose, and numerous abscesses formed, through which a probe could be passed into the antrum. The right nasal cavity was compressed by the swelling of the bone, and the eye forcibly pushed upwards. The canine and first molar teeth being extracted, and an abscess at the internal angle of the eye opened, there was an abundant purulent discharge, which was followed by the exfoliation of the os unguis, and of part of the processus nasalis maxill. superior; the abscesses in the gums discharged also osseous fragments. In this manner seventy-two pieces of bone were exfoliated; their total weight was 126 grains, and they consisted of the alveolar process; the anterior and external paries, and the nasal process of the upper jaw bone; the os unguis, and the nasal bone of the right side. After four months, the ulcerations began to heal; the patient's general health improved; the swelling of the face subsided, and the eye regained its natural position; in this state he remained for eight months, when he was again attacked with pain in the posterior part of the alveolar process; and with swelling of the gums; after an incision in the latter, the pain diminished; no pus was found; but within a few days, three molar teeth were protruded; and two months afterwards another appeared. Since that time the patient has enjoyed very good health; no more teeth have been formed, but the new ones have remained in good condition.—*Graefe u. Walther's Jour.*—*British Quar. Jour. of Dent. Surg.*

Artesian Wells.—We understand that it is intended to carry the bore for the Artesian Well in the Garden of Plants to the depth of 800 or 900 metres, whereas that at Grenelle is only 550 metres deep. The object of piercing so low is to find water of a high temperature. The expectation of doing so is founded on observations made by M. Arago and M. Walferdin at Grenelle, that the temperature of the water increased in warmth one degree at every 32 metres depth, and consequently at that of 800 or 900 metres must be at from 36 to 39 degrees centigrade, (about from 97 to 104 Fahrenheit,) with which the hot-houses of the equatorial plants, and also the lodges of the animals in the menagerie, and even the hospitals in that quarter, may be warmed in winter.—*French paper.*—*N. York Jour. of Med.*

Dental Caries.—This affection, so lamentable on account of the violent pain which it occasions, and its ordinary result the premature loss of the teeth, has numerous causes. But the recent labours of several pathologists authorize the conclusion, that in most cases caries may be ascribed to the presence of the acid liquid secreted by the glands of the gums, about the neck of the teeth. Experiments conducted with care, have shown that all the other secretions from the mouth, have a more or less decided alkaline character. This liquid is distinguished from them by a constant acidity which seems to acquire more activity in those chronic affections of the stomach, manifested by Anorexia, and weakness of the digestive organs. Nothing is more common, in fact, than the loss of teeth, after those long indispositions which can hardly be named diseases. It is rare, however, that the inferior incisors are altered, while the superior, on the contrary, are very subject to this change. Does not this remarkable fact point out that caries would be still more frequent were it not for the abundant secretion of saliva of an alkaline character. The inferior incisores, constantly bathed by the saliva, do not experience the effects produced by the acid secretion from the gums, to the same degree as the others, as the saliva by its presence neutralizes the acidity of this liquid. The useful conclusion to be drawn from this fact is, that in the daily attention bestowed upon the teeth, nothing is more clearly indicated than the use of dentifrices, in which the alkaline principle predominates.—*Archives de la Medecine Belge.*—*British Quar. Jour. of Dent. Surg.*

Suppression of Hæmorrhage at the Gum.—By THOMAS EMBLING, Esq.—The following case, illustrative of the great difficulty often experienced in stopping hæmorrhage from the minute maxillary arteries after the extraction of a tooth, will also show the efficacy of a simple method of cure in such cases, when pressure can be positively applied to the mouths of the bleeding vessels.

I was sent for, some time back, to a lady, who, on the preceding evening, had a tooth extracted by a dentist, and whose gum had continued to bleed profusely from the time of the removal of the tooth until I saw her, being a period of about eight hours.

I found the mouth filled by coagula, and a perpetual dripping of arterial blood escaping from the mouth. A variety of remedies had suggested themselves to the patient and her friends, but none had at all subdued the bleeding. On clearing the mouth thoroughly from the coagula, I observed that in the extraction of the tooth (the third molar of the upper jaw) the dentist had broken off a considerable portion of the alveolar process, leaving a point of bone sticking out in the hole which had been thus made. A large piece of the gum had been also torn away. Several minute arteries were bleeding freely in the gum. I employed all the usual remedies adopted in such

cases, but none of them, neither lunar caustic, nitric acid, nor the actual cautery, effected a cessation of the hæmorrhage.

After using such remedies as I could devise for three or four hours, I tried the effect of compressing the part between the finger and the thumb. This produced great nausea and vomiting at first, but having no other agent upon which I could at all depend, I determined to try the effect of long-continued pressure upon the mouths of the bleeding vessels. Of course, during the immediate pressure of the finger and thumb, no hæmorrhage could occur, as the part allowed a direct application to the open vessels; but at the end of an hour there was very slight, if any, diminution of the hæmorrhage; in another hour, however, the decrease of hæmorrhage was decidedly perceptible; in a third hour still greater improvement was evident, and by five hours and a half after I first employed pressure the hæmorrhage had ceased entirely.

For some weeks the gum was extremely tender, but gradually the tenderness has passed off, although at the present time the spicula of bone which was left of the alveolar process (for I did not deem it prudent at all to increase the loss of bone) is very painful when pressed upon suddenly and violently.—*London Lancet*.—*Boston Med. and Surg. Jour.*

Illegal Practice of Medicine in Paris.—Some months ago a trial took place before the Tribunal of Correctional Police in Paris, which abundantly shows the jealousy with which the authorities view persons practising medicine in the French metropolis without having previously procured the necessary certificates of competency.

The case was that of a lady in Paris, who had been so severely bitten by a dog as to be upwards of a month confined to her bed, and in great suffering, in consequence of which she brought an action against the owner of the dog, and recovered 500 francs damages. The defendant, however, appealed against the verdict on the plea that the original injury had been greatly aggravated by the bad treatment of the medical man whom the lady called in, and proved by a physician's evidence that the remedies used were calculated to irritate instead of allaying the painful symptoms. By these means he succeeded in materially lowering the amount of damages claimed by the lady; and at the same time the Tribunal having decided that the medical man (who was a recognized *officier de santé* for the Dep. Saone et Loire) had acted illegally in practising his profession in Paris without special license for the same, issued an order for his prosecution.—*Lon. Lancet*.

Potatoes a preventive and cure for Scurvy.—Much has been said of late in France and England of the value of this vegetable, in the prevention and cure of scorbutic disease, administered several times a day, in its *raw state*, but scraped sufficiently fine to make it digestible. It seems to have been

amply tested among the seamen of the French navy. In the United States army, however, this is no new remedy in scorbutus. Thus, in the first quarter of 1821, there were sixteen cases reported at Fort Crawford, Prairie du Chien, of which two terminated fatally. The medical officer, in his report, according to the "Medical Statistics of the United States Army," speaking of the employment of "*raw potatoes and vinegar*," says:—"I selected four or five of the worst cases, which had received no alleviation from the use of the nitre and vinegar, and directed each one to eat per day a common soup-plate full of the potato sliced down in a sufficient quantity of vinegar. It had an immediate effect on the stomach, which recovered its natural vigor; the bowels became regular, the pains abated, the stricture of the tendons was overcome, the ulcers put on a healthy aspect, and, in a few days, the patient found himself in a happy state of convalescence."—*N. York Jour. of Med.*

Dental Surgery in the United States.—The subject of dental surgery appears to attract considerable attention among our friends on the western shores of the Atlantic. A school of dental surgery has lately been established, and is now in full activity, at Baltimore, superintended by four professors. Candidates, after an attendance on the lectures during two years, (or for a less time if they should have previously attended medical lectures,) undergo an examination and write a thesis on dental manipulations; besides which, they are required to perform certain operations, and to make artificial teeth, palates, &c. which, if approved of, they receive the degree of doctor of dental surgery. We heartily desire that some such anxiety for improving this branch of the profession in this country should be evinced.—*London Lancet.*

An English General Practitioner.—On a cottage window near Plymstock is the following:—"I ——— Parish Clark Sargeant, Smith, tacheth yong Garls and Buoys to rade and rite daleth in mole candals shugar plums rish-lites comes, mole traps, mouse traps, spring guns, and all other sich matters —teeth distracted, blid drawn, blisters, Pils, mixturs maid, also nails, and hosses shoed, hepsome salts, and cornes cut, and all other things on rasonable Tarmes.—N. B. and also my Misses goes out has man whidwife in the cheepest way posuble."—*Dub. Med. Press.*—*N. York Jour. of Med.*

Medical Things in Paris.—It is rumored that Dr. F. Campbell Stewart, of New York, late family physician of Gen. Cass while a resident abroad, will soon publish a statistical account of the hospitals of Paris, together with memoirs of the most eminent French surgeons of the present day. No writer could have a more ample field to exercise in than this. If it is not an interesting and useful book, the author can make no satisfactory apology, so abundant and curious are the materials.—*Boston Med. and Surg. Jour.*

Mrs. M—, a lady, about twenty-two years of age, applied to me, in consequence of having suffered for eight months, severe pain in the branches of the superior and inferior maxillary nerves, coming at first in irregular paroxysms: latterly however they were periodical, and invariably came on at nine o'clock, A. M. and at seven, P. M. The severity of the attack generally lasted about an hour. It rarely occurred at any other time with violence, unless the patient was suffering from indisposition or mental agitation. At the early part of her suffering, she was induced by the recommendation and persuasion of a friend, to apply brandy and salt, mustard poultices, &c. but without effect. She consulted a physician of the highest character, who ordered the various preparations of iron in combination with quinine, which was continued for two months, but failed to give relief. Belladonna was now prescribed, commencing with one grain night and morning; one hour before the paroxysm came on, leeches and blisters were applied to the temple, with fomentations of poppies and camomile, with an increase of half-a-grain of belladonna at each dose, until three grains were taken twice a day. She now became so affected with sickness, vertigo, dimness of sight, &c. that this treatment was discontinued, and the ioduret of potass substituted, with the use of veratrine externally. These means were followed for six weeks without success. It was now suggested by a medical friend, that the disease possibly originated from diseased teeth. On examining the inferior maxilla on the left side, I perceived that the whole of the teeth from the canine to the dens sapientiæ were affected with caries, also the first and second molares in the superior maxilla, all of which were evidently producing considerable irritation in the surrounding parts. On these teeth being pressed, the paroxysms returned with the usual violence. I immediately removed the two bicuspidæ, and two molares of the lower jaw, and ordered Acet. Morphia, quarter of a grain; Mist. Camph, one ounce and a half; with the following aperient, Ext. Colocynth co. gr. vi. Hyd. Submur. gr. ii. in two pills,—with considerable relief. In the course of a week she was sufficiently recovered from the effect of the operation, to submit to have the other diseased teeth removed,—the dens sapientiæ of the lower, and the first and second molares of the upper jaw. The morphia draught and pills were continued for a few days, since which she has had no return of pain. A few months since I had the satisfaction of hearing that she was quite recovered, and had not experienced a moment's pain in the jaw, since the last operation.—*British Quar. Jour. of Dent. Surg.*

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*Accident to Baron Berzelius.*—This very talented and eminent chemist has recently had a narrow escape with his life, from an explosion which occurred during some experimental investigation in which he was engaged. Although the injuries sustained by him are fortunately slight, yet, seeing the extent of mischief produced by the accident, it is a matter of surprise that he did not pay the forfeit of his life.—*N. York Jour. of Med.*

## Miscellaneous Notices.

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### AMERICAN SOCIETY OF DENTAL SURGEONS.

*Fourth Annual Meeting.*—This association commenced its sittings in the city of Baltimore, on the 18th of July, 1843, at 10 o'clock, A. M. in the Assembly Rooms, corner of Holliday and Fayette streets.

Members present during the session—H. H. Hayden, M. D., D. D. S., President; Lewis Roper, M. D., one of the Vice-Pres't; Solyman Brown, M. D., D. D. S., Recording Secretary; Chapin A. Harris, M. D., D. D. S. Corresponding Secretary; Leonard Mackall, M. D., Treasurer; Jahial Parmly, D. D. S. of New York; David Randolph Parmly, New York; Edward Maynard, M. D., D. D. S. Washington City; Enoch Noyes, M. D. Baltimore; T. B. Hamlin, Wytheville, Va.; Charles Rowall, New York; Alexander Neilson, Albany, N. Y.; Edward Laroque, Baltimore; Wm. H. Dwinelle, Cazenovia, N. Y.; Jas. Alcock, D. D. S. New York; H. N. Fenn, M. D. Rochester, N. Y.; J. W. Howlet, D. D. S. Greensboro', N. C. J. S. Gunnel, M. D. Washington City; Sam'l W. Stockton, Philadelphia; Amos Westcott, M. D., D. D. S. Syracuse, N. Y.; Geo. Merryman, Baltimore; Oliver Holmes, Baltimore.

After reading and approving the minutes of the last meeting, Dr. C. A. Harris delivered the opening address, which was ordered to be printed in the Journal with the thanks of the Society.

This was the first occasion since the formation of the Society, on which ladies, including the wives and daughters of some of the members, graced and animated the meeting by their presence.

*Tuesday afternoon, 4 o'clock.*—On motion resolved that Drs. E. Parmly, S. Brown and E. Baker, be continued a committee to prepare a memorial to be presented to the Legislature of the State of New York, asking for a charter of this Society, and to hold property of the value of fifty thousand dollars, for the purpose of erecting a building in the city of New York, as the depository of its library, and other property.

On motion of Dr. Holmes, resolved that the thanks of this Society be presented to Drs. Taylor and Allen, of Cincinnati, for their kind invitation to hold the next meeting of the society in that city, informing them that the society has deemed it expedient for the present to meet in the city of New York.

On motion of Dr. Westcott, resolved that a committee of three be appointed to report at the next meeting on the subject of the Ligamentum Dentis. E. Maynard, E. Parmly and A. Neilson were that committee.

*Wednesday Morning.*—Dr. Bond one of the professors of the Baltimore



College of Dental Surgery, read a Dissertation on the Morbid Sympathies between the mouth and other parts of the body, which was ordered to be printed with the thanks of the society.

On motion of Dr. Harris, resolved that this society regards the use of mineral paste in plugging carious teeth as malpractice, and that a committee of three be appointed to receive information and facts on that subject, to be transmitted to Dr. Westcott, of Syracuse, in the state of New York, to be by him laid before the Medical Society of the county of Onandaga in that state, before which the subject aforesaid is now pending.

S. Brown, E. Parmly and J. Foster of New York, are that committee.

The members added to the society at this annual meeting, are as follows.

L. S. Allen, Winchester, Va.; Charles F. Martin, Norfolk, Va.; Charles Walker, M. D., Northampton, Mass.; John M. Howe, New York; Wm. Brown Gildea, St. Louis, Mo.; Edward Hale, St. Louis, Mo.; Elijah Bryan, New York; Samuel S. Hornor, Philadelphia; Dr. Ballard, Tunis, Africa; B. R. Robinson, D. D. S. Baltimore; J. A. Pleasants, Richmond, Va.; John B. Rich, New York; A. Robinson, Wheeling, Va.; ——— Porter, Bridgeport, Conn.; R. Woofendale, New York; Ed. Laroque, Baltimore; Geo. Merryman, Baltimore; A. W. Briscoe, Baltimore; J. W. Howlet, D. D. S., Greensborough, N. C.; Charles Linthicum, D. D. S., Baltimore.

*Thursday Morning 9 A. M.*—Dr. Westcott read a Dissertation on carious teeth, and the action of sundry agents upon these organs as determined by a series of experiments by him conducted, during the last year.

The thanks of the society were presented to Dr. Westcott for this Essay, and the same was ordered to be printed.

On motion resolved that a committee of three be appointed with instructions to provide and recommend a plan for guarding the society from imposition in the admission of members.

Drs. Westcott, Noyes and Mackall are that committee.

On motion resolved that the Treasurer be instructed to make out the bills for annual dues, and all other indebtedness of the members to this society, and present them immediately for liquidation.

The officers of the last year were all re-elected.

The Editors of the Journal for the coming year, are S. Brown, C. A. Harris and E. Maynard.

S. Brown was appointed to give the opening address at the next meeting of the society, and the following gentlemen were appointed to read dissertations.

Drs. Maynard, Laroque, Dwinelle, Westcott and J. D. McCabe.

*Thursday Evening.*—The society met at the residence of Dr. Hayden in N. Charles street.

Dr. Gunnel read a paper on the cutting of the Dentes Sapientiæ, which was ordered to be printed with the thanks of the society.

The society adjourned to meet at the American Hotel in the city of New York, on the third Tuesday in July next, 1844, at 10 o'clock, A. M.

SOLYMAN BROWN, *Rec. Sec'ry.*

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THE LAST IMPORTATION OF TRANSATLANTIC QUACKERY, RESHIPED FOR ENGLAND, WITH THE USUAL ALLOWANCE OF "DRAW-BACK."

The *famous*, or more properly, the *infamous* Monsieur Mallan, of mineral paste notoriety, the worthy successor of the Messieurs Crawcour, has recently taken French leave of his tailor, his shoemaker, his upholsterer, his printers, "*et id omne genus*," who have allowed him to run up bills without footing them, during the past two years in the city of New York.

The profession throughout the country are indebted to some of their enterprising brethren of that city, for having made such an *expose* of the malpractices of this consummate quack, as to induce the good people of New York to be on their guard in relation to employing a foreign mountebank, instead of the honorable members of the dental profession, who are located among them.

It will be remembered by most of our subscribers, that a circular was forwarded to them about two years ago, containing extracts from English journals, together with affidavits taken in New York, with respect to the practices and professions of the individual named above. Such was the effect of this circular as to prevent the empirical vagabond from gaining a footing in any other place than New York, where he was reduced to the alternative of either flight or starvation.

Such is the salutary effect of associated effort in suppressing imposition in dental practice. We hope our brethren in all parts of the country, will exhibit equal enterprise, in every similar case, to the end that the empiricals of the old world may learn to expect no success in the new. The editors of some of the London Journals deserve our thanks for warning the American public of the approach of the above named charlatan to our shores; and we hereby reciprocate the favor by informing them that he has lately returned to their island.

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*Dr. B. Randolph Robinson*, graduate of the Baltimore College of Dental Surgery, intends taking passage on board the barque *Louisa*, which is to sail in a few days for Valparaiso, South America, which place he proposes to make the future field of his professional labor. Few men have enjoyed more ample opportunities for thoroughly qualifying themselves for the profession of dental surgery than he has done, and few, if any, have profited more by them. And, uniting as Dr. R., does, to eminent professional abilities, the courteous, honorable and high-minded gentleman, he could hardly fail any where to win the confidence and patronage of an enlightened

and discriminating public. In leaving the circle of his friends and the scenes of his home and youth, to take up his abode among strangers and in a far distant country, he carries with him our best wishes for his future happiness and success.—*Balt. Ed.*

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*Incorruptible Teeth.*—We have recently received from Dr. J. Alcock, of New York, several sets of incisor and cuspidati teeth, which for beauty and resemblance to the natural organs, are unsurpassed by any which we have ever seen. Dr. A. certainly ranks among the very first manufacturers of incorruptible teeth in the world.

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*British Dental Journal.*—If any of our subscribers desire to take the above named periodical, the New York editor will supply them at the book-store prices, or four dollars per volume. The numbers of the current volume appear in London, in March, June, September and December. The arrival of the second number is expected daily. OTIS CLAPP, of Boston, is the American publisher.

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*Artificial Teeth.*—The first complete double set of artificial teeth worn in the United States, is said to have belonged to Aaron Burr; and to have been manufactured in Paris. We suppose they were constructed similarly to those represented in a plate in Fouchard's "Chirurgien Dentiste," inasmuch as little or no improvement was made in this department of the art, from the time of this celebrated practitioner up to nearly the close of the last century. But subsequently, and particularly during the last twenty years, the achievements in mechanical dentistry, or that branch of the art to which the prosthesis of the teeth belongs, have been most astonishingly great.

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*Notice.*—The newly elected members of the American Society of Dental Surgeons, are informed that they can receive their Diplomas by applying to either of the Secretaries. The cost of the Diploma is ten dollars, and the annual dues five dollars payable in advance.

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*To Correspondents.*—The letter of Dr. G. G. Brewster, of Portsmouth, N. H. to the senior editor, was not received until after the time when the writer intended it to be used. Dr. B. will see from the account of transactions at the late Annual Meeting of the American Society of Dental Surgeons, that a committee was appointed to take into consideration and report upon the subject in which he feels so warm and commendable an interest. The valuable suggestions of Dr. G. will not, we trust, be lost upon the committee.

M.

The letter from Dr. J. C. M. will appear in the next number.

*Dr. Westcott's Essay on Caries of the Teeth.*—The highly intelligent and enterprising author of this treatise, has opened a new and beautiful field of inquiry, in relation to the decomposition and destruction of the teeth of man, for which our age and country are so unfortunately remarkable.

While some laborious and learned writers are controverting the mooted question, whether caries of teeth is internal or external in its inception—hereditary or superinduced—the effect of external agencies, or systematic disease, Dr. Westcott proceeds directly to the experimental investigation of the chemical agencies of all those substances which are liable to be brought into contact with the human teeth during the ordinary life of man. Having instituted numerous carefully conducted experiments, and opened the way for increasing the number during the coming year, he is preparing himself to present definite results, which will be of the greatest value to those individuals who are anxious at all periods of life, to use proper measures for the preservation of the organs of mastication. And there can be no doubt that there are many such persons in all the upper classes of society in every civilized nation of Europe and America.

The most important instruction which the community at large will derive from the course of experiments referred to, relates to the occasions on which the welfare of the teeth depends on a careful cleansing of the mouth after certain kinds of medicine and diet. If, for example, it be found that the acid of the dried grape or raisin, acts with peculiarly destructive energy on the calcarious enamel and bony structure of the teeth, the lesson inculcated by Dr. Westcott's experiments, will be, that every person who eats this fruit, should invariably rinse and wash the mouth and teeth immediately afterwards, in order to remove this acid; for many substances which would destroy the teeth, might not injure in the least the coats of the stomach or other tissues of the animal economy.

There can be little question of the fact, that many persons injure their teeth incurably, without even so much as suspecting the mode in which they do it. The object of the dental journal, the dental society, and every honorable dental practitioner, should be to enlighten public opinion on this subject. But public opinion can be reached only through the dental profession in this respect. Dentists themselves must first understand the evil and the remedy, before they can instruct their patients and the public generally.

In the present condition of the profession, it may safely be averred, that not one dentist in three can allege any satisfactory reason why the teeth should be cleaned at all, excepting that they may present a more beautiful appearance, or that tartar may not undermine and destroy the gums. The action of various kinds of medicines, drinks and diets, is almost wholly unknown, and thence they are utterly unable to respond to the often repeated question—"How can it be that my teeth have decayed so rapidly?" The dentist is often assured by his patients that their parents had such fine teeth that they took them all with them to their graves; and they wonder how it has happened that, before thirty years of age, all their own teeth have crumbled and disappeared.

Dr. Westcott's experiments will enable himself and his readers to reply to some of these inquiries in a manner which will be wholly satisfactory to every reasonable mind. They will show with the conclusiveness of demonstration, that the teeth are soluble in many of the acrid fluids which are introduced into the mouth, in connexion with the daily habits of the individual; and they will show, furthermore, what are the substances in which these fluids are contained.

If we are permitted to make any suggestions on this subject, in regard to the future experiments of the able individual who has taken this subject in hand with such zeal and perseverance; we would solicit that he so classify his trials as to be able to say positively whether the action of the various solvents of the teeth be in inverse proportion to the age of the subject from whose mouth the teeth are taken, or whether the solvency depends on some other law. In other language, are the teeth of children, as a general rule, more readily destroyed by corrosive agents than those of youths; and are the teeth of persons in middle life more liable to be affected by foreign agencies than those of later years. These are questions, the proper solution of which will be regarded as of incalculable value to all mankind.

That differences in the susceptibility of the teeth of different individuals to the action of solvent agents, are owing to the differences that exist in their density, as is stated by Dr. Harris in his treatise on dental surgery, there can be no doubt, but it would be interesting to the profession to know how much this is influenced by age. That the organs for a time, gradually acquire an increase of density after their eruption, there can be no question, but to what extent, and how long they continue to increase in hardness, yet remains to be shown, as well as the difference between the density of the temporary and permanent teeth. On all of these subjects, the experiments of Dr. W. will doubtless throw much valuable light.

We conclude by expressing the hope that Dr. Westcott will go on with his experiments with renewed zeal after the very kind reception which his essay experienced in the society to which it was addressed. Within a few hours after it was read, the Faculty of the Baltimore College of Dental Surgery conferred upon him unanimously the degree of Doctor of Dental Surgery.

B.

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*Dr. Bond's Essay on the Sympathy subsisting between the Teeth and other parts of the human system.*—The attention of the profession is respectfully called to this excellent production, as well in regard to the essential importance of the subject to the dental practitioner, as to the lucid and truly scientific manner in which it has been treated by its talented author. Dr. Bond who is one of the professors in the Baltimore Dental College, the son of the venerable Thomas E. Bond, M. D., of the city of New York, was well known to be fully qualified for the task, when he was invited by a resolution of the society, at its annual meeting in Boston, to give an essay on the subject of Dental Sympathy at the next session.

Inasmuch as the society deemed this subject of sufficient importance to warrant its reference to a specially qualified physiologist, and as he has performed his task with great credit to himself, and to the entire gratification of the society which requested it, we trust the truths which it inculcates will commend themselves to all our professional brethren, in such a manner as to be practically useful.

B.

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Correspondence.—The propriety of publishing the following letter to the Society, separately from the minutes of the last meeting, to which it might seem appropriately to belong, will be acknowledged, we hope, when we suggest that we have a desire to offer a few editorial remarks on one of the topics to which it briefly alludes.

MY DEAR SIR:

Painesville, July 11th, 1843.

From the time that I took leave of you last year, in Boston, there has been no period or event to which I have looked forward with so much interest and pleasure, as that of meeting you again this season, in the city of Baltimore, surrounded by the members and friends of our institution, whose professional and personal characters I so highly appreciate and value; but an illness, as disastrous as severe, occurred in my family, which completely broke up all my plans for the summer, and made it necessary that I should remove from the city as soon as possible, it not being safe, under existing circumstances, any longer to remain there, and travelling was recommended as the most efficient means to restore that health that had been so unexpectedly invaded. On our way we were delayed several days on account of illness, in which I have been a partaker, and we did not, until yesterday, reach this place, which is the end of our journey.

I pray you to present my most friendly regards to all the gentlemen that may be assembled on the present occasion, and express to them the deep regret which I feel in not being able to meet and unite with them in advancing the interests of a cause so dear to our thoughts, so honorable to our pride, so creditable to our ambition, and so well deserving our highest efforts to foster and build up, not only for the good of suffering humanity, and for the profession in which we are engaged, but also to do away with that prejudice in the minds of our fellow citizens, that has hitherto, with its dark and withering influence, thrown a shade of distrust over all the individual efforts that have been made to protect our rights, or guard the public from imposition and abuse.

I do not know of any one in this country, whose individual efforts did more to make the public respect our profession or value our services, than the labors of the late Dr. Hudson, of Philadelphia—and as he is now gone from us, I have thought that the dentists throughout the United States, out of respect for his character and regard for his high professional merit and distinction, would feel happy in having an opportunity of contributing

something towards erecting a stone to his memory, with a suitable inscription, which would, while they testify to the high character which he attained by his talents, faithfulness, and industry, also show forth their high appreciation of the character and the value they set upon his example of truth and honesty while engaged in his professional labor.

I think, if a notice was given in the journal, and a treasurer appointed, a sufficient amount would be collected by our next meeting to show the respect of our professional brethren for the character of their late distinguished fellow laborer in the field of dental science. If such a thing should be thought advisable, I would suggest that a neatly printed certificate should be offered to each one, showing that he was a contributor to the erection of a stone to the memory of Hudson.

That the same peace, good will, and unity which have distinguished all our meetings may prevail, is the sincere and ardent wish of

Your greatly obliged friend,

E. PARMLY.

TO H. H. HAYDEN, M. D.

President of the Am. Soc. of Dental Surgeons.

The erection of a suitable monument to the memory of the late Dr. Hudson, of Philadelphia, is a tribute so justly due to his exalted merits as a dental operator, that its propriety cannot be questioned for a moment; but in regard to the *mode* of doing it there may be room for discussion. That the members of the profession, generally, will gladly and liberally contribute to such an object, there is not a question, provided the position in which the memorial should be placed could in any degree comport with the character of him whom it should commemorate, as well in regard to its permanency, as its scenic accompaniments and accessories. In case the remains of the lamented Hudson shall have been deposited where such a superstructure would be either improper or impossible, a site for the proposed monument might be obtained in the new and beautiful rural cemetery attached to either of our large Atlantic cities.

But, it has been suggested that the memory of Dr. Hudson might be more effectually perpetuated by the publication of his likeness in the *Journal*, as recommended by the Society at its second annual meeting. A committee was then appointed, with instructions to obtain, if possible, the loan of a portrait of this distinguished dentist, for that purpose. This tribute of respect to his memory might, and we doubt not would, be more gratifying to the profession than the erection of a marble or granite monument, which the larger number of our brethren would never have an opportunity of seeing.

We do not intend in this place to attempt his eulogy. We shall leave that task for wiser heads and better hearts. But we confidently reiterate the opinion that some tribute of respect not merely *ought* to be, but *will* be, offered by the American Society of Dental Surgeons, to the memory of the departed Hudson.

B.

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[No. 2.

ARTICLE I.

THE SCIENCE OF THE HUMAN BODY.

An Introductory Lecture, delivered before the Class of the Baltimore College of Dental Surgery, at the commencement of the Winter Course, Nov. 1843. By W. R. HANDY, M. D., Professor of Anatomy and Physiology.

Gentlemen of the Dental Class :—

A distinguished author, in speaking of science, describes it as a "collection of facts, governed by laws," and these facts when looked at, we find beyond conception—in their number, variety, extent and relations. They cover no less a field than nature herself, comprehending her three great departments, viz. the mineral, the vegetable, and the animal kingdoms; and each of these departments is filled with a multitude of facts—hosts of which resemble each other so closely in their general form, size, common construction, and mode of operation, as to be considered identical in their very nature—and governed by the same general and common truths—which truths constitute so many *laws* belonging to the science, presiding over and embodying all such collection of similar facts. But the facts are not all alike, being in truth almost as various in kind, as they are multitudinous in number. Hence, every dissimilar collection of facts must have its own set of laws, and these laws must be referred to another and distinct science. Hence, it seems, that with the variety of facts, there must be a variety of laws, and a variety of sciences.

"There are in nature," says the celebrated Bichat, "two classes

of beings, two classes of properties, and two classes of sciences: the beings are either organic, or inorganic; the properties vital, or non-vital—and the sciences physiological or physical.

It is not our intention here, even to enumerate the different sciences, much less to examine the various facts belonging to each; our object at this time being simply to direct attention to one science alone, viz. The science of the human body; a science which interests you, as its students, above every other science; forming, as it does, the sole basis on which alone a substantial reputation and prosperity, in the future practice of your profession, can securely rest; and the possession of which, each of you will doubtless, ardently and very properly aspire after.

It is, therefore, our earnest wish, gentlemen, to endeavor, if possible, to awaken in each of us, at this the outset of our course of studies, such an amount of proper feeling and degree of interest in the science of the human body, as will enable us to make a right and vigorous beginning, and pursue the same, step by step, faithfully and perseveringly to the end. To accomplish this, we propose presenting the claims of this science in some of its more attractive and cardinal features, as, viz.

- 1st. In its importance and utility.
- 2d. In its beauty, and,
- 3d. In its magnitude or extent.

The first point, viz. the great importance and utility of this science, all readily acknowledge, when its object is simply mentioned, viz. the preservation of health and life. An object as far surpassing that of every other object of science, as health does that of disease, or life that of death. An object, the possession of which, man has sacrificed every thing to attain;—wealth, business, friends—all these ties are and have been sundered;—time and distance consumed without measure, or hesitation;—oceans crossed—mountains scaled;—the world ransacked for its springs;—in a word, every thing considered as nothing in comparison of this object—health.

Well, the science of the human body is the only one, honored with the power of reaching this object; of infallibly guiding the diseased and worn out sufferer to it, and of finally rejoicing his heart by putting him in possession of it. This science thus pre-

eminently exhibits itself over every other, in its importance and utility to mankind ; and, by consequence of right, claims a proportionate superiority of all the dignity, respect, and gratitude, considered as belonging to any other science ; in a word, it is the science of humanity, and to which, we shall see, as we pass along, all other sciences are more or less subservient and tributary.

The second feature, viz. the *beauty* of this science, is seen in the whole and every part of the human body. In the physical sciences we behold, for example, a watch, a specimen of the greatest ingenuity and skill ; we are struck with admiration at the multitude and variety of its several parts, of their various form, size and direction ; of their wonderful adaptation and harmony of action ; and the no less astonishment, that the whole, notwithstanding being enclosed in so small a compass, and having such variety, should, nevertheless, all conspire, as by one common consent, to one great end, viz. the noting of time.

This example, all readily admit, is one of great beauty, both in design and skill—of design in the conception—of skill in the execution.

We behold a river having its origin in some distant and obscure spot, by a very small and insignificant beginning ; we trace it on, step by step, as it descends the mountain and traverses the valley, and are struck with wonder and delight how this same body of water, which at first a mere point or speck, should become the mighty river before us, having thus swollen in majesty and strength in its onward march ; being at one point the roaring cataract of the forest—at another the gentle visitor of the plain. This, every taste instinctively accords as an example both of great natural *beauty*, as well as utility in the natural world.

In the organic sciences, we behold as specimens in the vegetable department, the towering oak of the forest, and the beautiful lily of the valley. The former commencing by a small point or germ ; in other words, is born—casts its tender roots in the earth, and sends its delicate trunk and branches in the air : the one descending deeper and deeper, the other higher and higher, till at last having reached its utmost development in size and strength, presents itself in all the *beauty* of its now full and matured proportions.

The lily, likewise, has its birth, growth and maturity, and expands and blooms in the richness of a dress, pronounced as surpassing in beauty all the splendors of Solomon; and in the animal department we behold the strength and ferocity of the lion, with the docility and gentleness of the lamb.

Yet, with all these specimens of beauty in the physical and organic sciences, and truly beautiful they are; with countless more equally so, what may we ask, are they all in comparison with the beauty of that which nature herself has pronounced her master-work, viz. the human body? for here we have a body possessing, in greater or less degree, the nature of every other body; and a science embracing the phenomena of both the physical and organic sciences, consequently combining the beauties of both; and hence, by necessity superior to either.

Have we admired the machinery of the watch, and its beautiful precision in noting time? Can this compare with the tenfold more complex machinery of the human body, and its still more beautiful precision in the preservation of health and life? Have we seen the beauty of the river, when stalking proudly in its course, and bearing on its bosom the riches of many soils, and fertilizing every where the land it visits? How much more have we to admire the circulation of the blood; a stream which moves onward without intermission from birth to death, and by a power superior to that of gravity; sending off endless ramifications in its course, which not only fertilizes the whole of the physical part of man, but further scatters its blessings, by so refreshing the human body, as to make it a living and fit temple for the exercise of those affections and faculties which peculiarly characterize its surpassing *beauty* over every other body.

We have also noticed, in the organic sciences, the beauty of the vegetable and the animal, in their birth, growth and full development in maturity. The human body has likewise the same physical charms of the plant, or the animal, as it goes through precisely the same stages of a birth, growth, and full development; but it has more, for in its several stages of infancy, childhood, youth, and manhood, there is added the additional beauty of the mind, which casts its intellectual and moral lustre over the physical frame of man, and making the whole and every part still

more beautiful, whether seen in the eye, the countenance, or the gesture.

The following beautiful sentiment of the poet makes any further remarks unnecessary on this head; he exclaims: "How noble in reason! How infinite in faculties! In form and moving how express, and admirable! In action, how like an angel! In apprehension, how like a God! The *beauty* of the world! The paragon of animals!"

The third and last feature of the science of the human body we have to notice, is its *magnitude* or *extent*.

The human body, as already seen, being composed of both a physical and organic nature, its science is necessarily commensurate with, and embraces both the physical and organic sciences. But being likewise a mental body, it has, in addition, the vast field of the science of mind, comprising education and government.

Let us now briefly look at these several features in another and still more important aspect. We allude to the question of what constitutes the fundamental elements of the science of the human body? The answer to which will be found to embody a still more satisfactory explanation of the several features of this science, than what has just been advanced. These elements may be considered under three heads, viz. 1. A fixed and definite structure. 2. Fixed and definite functions, and, 3. Fixed and definite relations of structure and functions, with external or vital stimuli.

By the first element we include bone, muscle, blood-vessel, nerve, membrane, ligament, tendon, &c.; each of which has its own special and definite structure; embracing, likewise, the form, size, color, density and direction peculiar to each.

These several parts, variously combined among themselves, and with the fluids, compose the different organs of the body. Now, these organs, having as already stated, a fixed and definite structure, are endowed with a peculiar property or principle, of what, in an abstract view, may be considered over, and independent of the simple structure itself, and thereby gives to each particular structure, its own special value and interest. As, for instance, the *nerves* are endowed with the property of sensibility or feeling; take away this property and all our sensations and im-

pressions would be gone; all the great highways of knowledge by the senses would be closed; and the mind of man, with his whole existence, a pure blank. The *muscles* are endowed with the property of contractility, or the power of shortening and lengthening themselves. Let us, for a moment, remove this property, and all the wheels of life immediately stop. The heart ceases to beat; the blood, by consequence, ceases to circulate, and the pulse is no longer felt. All motion in the limbs is gone; the hands cannot rise to gesture; the feet cannot move to walk; the eye cannot turn to see; neither can the mouth and larynx move to speak.

Cartilage has the property of elasticity; destroy this, and you at once destroy all that buoyancy, lightness, and ease of motion which characterise the graceful and natural step: take away this property, and the function of respiration, that most vital of all functions, will be most seriously injured, if not fatally destroyed.

Bone has the properties of solidity and strength; remove these, and the foundation of the human body is at once broken up; its form gone; its beauty fled; its strength vanished, and all the softer parts, having nothing to support them, must immediately tumble into a confused and shapeless mass.

But it is unnecessary to multiply further examples, showing that each particular structure has its own special property; as all we have in view, from this selection, is simply to set forth, if possible, in a still more conspicuous manner, the *importance, utility, beauty, &c.*, constituting the prominent features of the science under discussion.

The second fundamental element named, is function. By this we mean, that every organ of the body has a distinct and special act or duty to perform, which act or duty is styled its function. The functions are various as, viz. those of circulation, respiration, sensation, secretion, &c.; which will come more particularly into notice at another time. This element is inseparably united with the first, in fact, cannot exist without it; the two go hand in hand, and both conjoined exhibit the science of the human body in two very distinct and opposite states, to wit: that of health and disease. These two states embrace the divisions of anatomy, physiology and pathology; and thus bring before us in a striking

manner, another feature of this science, viz. its magnitude or extent.

The third and last element we propose to notice, is the relation or relations of structure and function. This being an important practical point, we shall examine it according to the several kinds of relations established by nature, as belonging to the different structures and functions. These may be reduced to three heads, viz. 1. The physical. 2. The organic, and 3. The mental relations.

The physical relations of the human body, are those it has with atmospheric air, water, aliment and heat. These four substances are termed vital stimuli; as they are indispensable, both to the existence and preservation of life; and the relations which these vital stimuli have with the different organs and functions, are so close and absolute, that we find nature has established them as so many fixed, positive, and unchangeable laws, for the government and well being of the body. Indeed, so unalterable and important are they in their character, that nature further backs their execution by bestowing the richest rewards for their observance, and inflicting the severest penalties for their violation. That such is the fact, a familiar example or two may be necessary. Every one knows and constantly feels the necessity of being able to breathe; and yet, if breathing be stopped but a few moments, in other words, if atmospheric air cannot be inhaled, life will certainly cease. Now, this is owing to the fixed and positive relation between the lungs and function of respiration, on the one hand, and the external vital stimulus atmospheric air on the other; and this relation, as just stated, is so fixed as to become an absolute law in every similar case. For, if we take any other air than atmospheric air and breathe it, we violate the law; because nature has made atmospheric air for the lungs, and will have no other substitute; and, if we persist, each will certainly suffer in proportion to the violation; that is, in the degree that the air taken into the lungs departs in its constituent elements from true, pure, atmospheric air. Who has not heard of well-diggers, instantly expiring by breathing a foul air, when reaching the bottom of the well, and so impure that a candle put into it, is immediately extinguished. How many thousands of the poor unfortunate

miners of England have fallen victims to the choke-damp, a foul air; principally carbonic gas, and met with in their mining operations; we say, how many have thus lost their lives till the immortal discovery of the safety-lamp by Sir Humphrey Davy? But a still more familiar example is, the loss of life from breathing the fumes of charcoal, used as a substitute for the ordinary fire in the warming of bed rooms. Now, in all these instances we see the grossest violation of the law; for, in every case, the air breathed has been of the foulest and most impure kind, chiefly carbonic gas, a poison at once fatal to life, and as far as possible in its properties from atmospheric air. And what, the question occurs, do we witness as the penalty in all such cases of violation? The answer is familiar, that death, speedy death, is, in almost every instance, the dreadful consequence. It may be said, a person may breathe oxygen-gas, nitrous-oxyd-gas, and other airs, more or less impure, and all different from atmospheric air, and yet not die. These, however, form no exceptions to the law; for, it does not say, that all shall immediately die, but that all shall suffer in proportion to its violation. Now, the several airs, just mentioned, not being so poisonous as carbonic gas, just punish in the degree they are poisonous; so that we should naturally expect the symptoms and sufferings to vary in every case, precisely in the degree that the air is more or less impure, and differs from atmospheric air. On the other hand, let the atmospheric air be ever so pure, if we change the condition of the lungs and ribs, the law will still be violated. The lungs, for instance, are made to receive a certain quantity of air suited precisely to the wants of each particular case. If, now, from any cause whatever, they have their natural size or volume diminished, they become incapable of receiving this necessary quantity; which, though it may not immediately, will, in the end, as certainly destroy life, as too often seen in the case of consumption.

The fact that consumption exists, and is a fatal disease, and that too many of the fairer portion of our race fall its daily victims, all are ready to acknowledge; but how that too little air can produce it, may not be so clear; and, therefore, justify us in attempting a brief explanation.

When any compressing power is applied to the chest, such as

the ordinary mechanical means in daily use for improving the beauty of the form, the ribs cannot rise and fall as nature designs they should ; but, by being constrained and pressed in, they in turn press upon the natural cavity of the chest, and thus lessen the space in which the lungs are to play ; hence, the lungs themselves are necessarily pressed upon, and they are, in turn, diminished in size. When in such condition, it is utterly impossible for the unhappy sufferer to breathe the quantity of air nature demands for healthy respiration ; the consequence is, the two great functions, viz. respiration and circulation, become embarrassed. A short and hurried breathing announces the fact in the one case, while the prominent, blue and slow venous circulation as clearly shows it in the other. These symptoms report that the blood is not sufficiently changed in the lungs, from the fact of their being compressed to such an unnatural degree, that the required quantity of air cannot enter to meet the demands of the case ; the necessary consequence being, the blood must leave the lungs unchanged, and thus go the round of the system, carrying its impurities to every part, and thus making every part to suffer. This state of things being continued day after day, the whole system becomes gradually undermined, the general health begins to fail, all the organs more or less to falter, and the whole body to waste. But still the patient may not be alarmed, nor friends suspect the real condition, when the truth is, consumption has already possessed the system, and tuberculous matter everywhere being deposited ; but the fact fails to be discovered, or is not acknowledged, till too late to apply a remedy ; not very often till hectic flush, night sweats, frightful cough, and growing emaciation, all too plainly show the real state of the case, and when death then is so near at hand that nothing can be done.

It is true, consumption may be hereditary, and arise from other causes ; but this does not alter the fact, that a confined chest and crippled lungs, by preventing the proper quantity of air from being breathed—in other words, that the violation of nature's law of relation between the lungs on the one hand, and the air on the other—is not also a most frequent and unsuspected source of this most fatal disease ?

The same may be urged for the rest of the physical relations, viz. water, aliment, and heat.

Water composes by far the greater portion of the fluids of the body, and greatly exceeds in weight that of the solids. Now nature is equally positive in this relation, as that of atmospheric air; her law is, that water is the natural fluid of the body, and that no other will answer; so that if man substitutes spirits, wine, or any other drinks, he violates the law, and must expect to suffer in proportion to the violation. It is unnecessary to multiply proof on this head, the bare mention of intemperance being all that is necessary to show the dreadful penalties which await the violators of this law.

And so with *aliment*; if we take poison instead of food, or food and fruits partly decomposed, and hence in a partial decay, the natural relation is destroyed, and the consequence is always injurious, and in many instances quickly fatal. And finally, as to *heat*, every one is aware that a certain amount is absolutely necessary for life; hence the necessity of the due observance of that law regulating the proper amount of clothing.

Now all these relations regard the body in a state of health, and belong to that department of the science we are examining denominated *hygiene*. But there yet remains another class of physical relations of a very different kind, and which regard the body in its opposite state, viz. disease; these are the remedies, constituting the *therapeutics* of the science; the simple mention of which, is all that we can here attempt.

We now pass to the second class of relations, viz. *the organic*, by which we mean the connection that subsists between the whole and every part of the body, usually termed sympathy; the body being a unit, and forming one complete whole, must necessarily have every organ to feel with and for every other organ. This being the case, when disease invades any portion of the system, all the rest being more or less closely related with the suffering organ, and having one common interest, must likewise expect to feel and suffer, and that generally in the proportion of the nearness of the connection, and the amount of influence each may have in the general economy. Hence disease of the stomach, liver, uterus, &c. &c. may affect the teeth, and disease of the teeth in

turn affect either or all these organs ; so that to understand any organ thoroughly, whether it be the teeth and their appendages, parts which are to claim your attention more particularly, it is absolutely necessary for us to study and become acquainted with every other organ—in other words, to study anatomy, and that kind of anatomy which can only be learned with the knife in the dissecting room.

Hence, gentlemen, it will be perceived that a proper knowledge of the dental profession is by no means limited, as too many are pleased to do, simply to the teeth alone ; but, on the contrary, that these organs are proportionately commensurate in their relations and influence with all other organs ; and hence, for the exercise of the proper skill in the detecting and treating their diseases, or letting them alone altogether, which is often preferable, belongs peculiarly to the dentist. And hence, we say, to exercise a conscientious judgment in your profession, not only a knowledge of every other organ besides the teeth is necessary, but also no small share of the science of medicine in general.

The last class of relations belonging to the science of the human body is, viz. *the mental*:—that the mind and body are closely related, and reciprocally influence each other, no one pretends to question ; the fact of sudden and disastrous news immediately destroying the appetite, and of fever producing delirium, are sufficient evidences of the close union of the two.

The mind also, has relations with the external world, and through the medium of the bodily senses ; this is a fixed law of nature, and remains such, notwithstanding all that mesmerism says to the contrary ; nature declares by this law that all our knowledge must come through the senses—mesmerism says no ; nature affirms the law positive and absolute as all her other laws, and consequently appends penalties for its violation ; while she, on the other hand, bestows the richest rewards for obedience. Knowledge is the priceless treasure given for observance, while ignorance is the heavy penalty for violation.

Lastly, the mind has a further and very extensive set of relations, viz. with all other minds. This relation communes with the dead as well as the living, it regards the past, and looks forward to the future. By this relation the science of the human

body is greatly extended, and owes its highest and proudest elevation: for, from this communion of mind with mind, the action of each on the other, and the perpetual conflict thus carried on, do we owe all the high and inestimable privileges of civilization, as science, government, the arts, &c. &c. By it, our knowledge of the external world is made pure, precise, and practical. By it, our natures tend to higher and still higher stages of continually progressive elevation and refinement. And, finally, out of it and to it do all other sciences owe their origin and bring their treasures.

This hasty view of these several relations has, in another light, brought before us, as it were in a single glance, all the prominent features that have been mentioned as belonging to the science of the *human body*, viz. its *importance* and *utility*, *beauty* and *magnitude*.

And in conclusion, gentlemen, we trust these points have been so exhibited and illustrated, as not only to show the inherent value and dignity of your science, but what has been the main burden of all we have been trying to say, viz. to awaken, at the outset, in each of you, a proper and lively interest for its honor and usefulness, and to impress the fact that it is only by constant and persevering study on your parts, that you can, in the first place, hope to obtain a reputable acquirement of this science; and then, in the second place, maintain inviolate its honor, and be a useful and vigilant member, in promoting its onward advancement.

Baltimore, Nov. 1843.

ARTICLE II.

Extract from a Letter to the Baltimore Editor. By DR. J.C. McCABE.

Virginia, July 31, 1843.

DEAR DOCTOR.—I regret that indisposition prevented me from fulfilling, in Baltimore, at the last annual meeting of the “American Society of Dental Surgeons,” the appointment made at the previous meeting in Boston—an appointment as flattering as it was unmerited. However, my regret at not being able to be present on the interesting occasion alluded to, is modified by the

belief that the distinguished members of the profession, appointed as my coadjutors, acquitted themselves in a manner commensurate with their fame.

It is a matter of congratulation to the worthy of the profession, that through the instrumentality of those, who themselves have arrived at the very summit of professional excellence, our long degraded science has been dragged from the odium that selfish cupidity, and ignorant quackery had thrown around it, and once more placed upon its pedestal, beside sister sciences, whence it had been hurled by hands that touched but to desecrate.

Do not think that it is my design to *lecture* the profession upon any one subject in the range of our science *proper*; older and abler hands have opened to our eyes the volume of their experience, enriched by the successive offerings of successive pilgrims, in the pursuit of professional knowledge, until the cry of "Eureka" has resounded from one chamber of the temple to all the rest. The harvest, which at one period, seemed to be whitening beneath the sun, untouched, has been gathered by the early reapers; and it would seem, now, we are compelled to pause, for there seems to be scarcely a grain left to the late gleaners in the field.

I look then, upon our association, more as a band of union between worthy professors of our art, than as a school for instruction in the science—designed to protect the gentleman, and the scientific practitioner, from the odium that should ever attach to the charlatan—intended "to give the world assurance" of professional competency, and moral worth, and also to hold up to scorn and contempt, the man, who void of a knowledge of his professed science, and wanting in moral stamina, would take advantage of the ignorance, or confidence of the community.

It would not suit the limits of this letter to enter into a comparison, of the various theories set afloat at different periods, by opposing writers on the theory and practice of dental surgery; much error has undoubtedly been mixed with much real good; and as all science in its infancy has had to struggle slowly through the mists which necessarily invested its discovery, it is not to be wondered at, that men of scientific knowledge, in assigning our art, "a local habitation, and a name," should have erred in some of their views on the subject. It would only be necessary, if

this proposition was sought to be controverted, to turn to the history of "the rise and progress," of our older sister, medicine. How slowly did she travel! How halt by the wayside! How medicine, and mountebankry, physic and folly, travelled together. Now empiricism, and now dogmatism; but look at her now, "throned in light," the discoveries of successive ages tending to place her higher and still higher upon her imperial tower!

Age after age bringing its tribute to her stores; name after name of the gifted ones of earth, swelling the train of her votaries: the mighty march of mind pouring in its hosts to her cause, until the science of medicine has become the loftiest pursuit of the proudest intellects, and its benefits extended to the "farthest verge of our green earth."

I say, it would not be in place to discuss the different theories of writers on the science of dental surgery—but I do think it would not be out of place to make some allusion to those nightmares upon our efforts to elevate the profession, viz. *dental quacks*.

Foreigners have been pleased to say of the Americans, that they are the most gullible people on the face of the earth; and although national pride may make us wince under the sneer, I have sometimes thought our sensitiveness on the subject was that of the "galled jade." It may, nevertheless, if properly viewed, be considered as an *amiable weakness*, an excess of good feeling, growing out of a peculiarity of temperament, superinduced probably by the genius of those institutions we are proud to believe peculiar to our land. In America, I speak now more particularly of our southern states, but I am sure it applies with propriety to other sections of the country, he who bears himself with propriety, and *seems* to deserve encouragement, rarely fails of success.

This would be an elysium indeed—a paradise in truth, did the world at the present day, hold no serpents, to wither in their slimy track, the green leaves and bright flowers, the pleasant pathways of our Eden. But, unfortunately, there are bad men in our world, men who are unpossessed of one moral excellence; men, with whom the sanctity of an oath, and the jest of the merry-Andrew, are alike held in respect; men, in whose cranium the organ of acquisitiveness holds prominence; and to such as these, conventional laws are but as "a rope of sand." The morals of a com-

munity, and the etiquette of the brothel, hold equal place in their veneration, and such will be found wherever the footsteps of poor fallen humanity have pressed the soil. They are incidental to no particular profession.

The sacred temple finds them kneeling at its altars, and quaffing its cup of communion. The ermine of justice finds the unhallowed pulses of such, beating beneath its folds. The bar finds such, with their unsanctified hands, grasping the glittering bribe. The bed-side of suffering sickness, is darkened by such, too often, who, for the "yellow trash," drug the bowl, and still the pulse; and it will not be presumed, that *our* profession can expect to be exempt from such characters, without *tests of professional and personal worth*, when we behold in other bodies, that have thrown around them *compacts*, tests of *proficiency* at least, such sad evidences, that if

"Some flowers of Eden we still inherit,
The trail of the serpent is over them all."

No man, I am convinced, should ever enter a profession of which he is ashamed. If his pride makes him revolt from the disadvantages under which that profession may place him, he should weigh well the chances before he risks his feelings in the experiment; and yet I have sometimes felt the shame-spot burn upon my cheek, and the heavings of a proud heart swell my bosom, when, in strange communities, (until known,) I have fancied my profession under ban, because some miserable effigy of man, some soulless, shameless, ignorant pretender had preceded me, disgraced his profession, and injured the health of his patients by his abominable malpractices; and under the influence of such feelings, I would gladly have abandoned my calling, and never breathed its name, had I not remembered that "sufferance" was [not] "the badge of all our tribe;" but that all professions had to bear the odium of unworthy members. Perhaps, though, I might again remark, that all the other professions have had tests, by which admission was gained into their fellowship, but *ours*.

Alas, alas! an unlicensed army, a lawless mob, the practitioners of dental surgery have gone forth, "armed to the *teeth*," too literally; flourishing their tooth keys, and in some respects slaying, like Sampson, the Philistines, with the jaw-bone of many an ass,

till their names have struck terror to neighborhoods, their practices destroyed many a good constitution, and laid low in death many a beautiful brow, and many a rosy lip; until the profession, Atlas like, has had to bear upon its shoulders a world of obloquy.

The intellectual and the honorable members of the profession, bore the opprobrium, smarting, it is true, under its infliction, until a bold and determined few, men of "stout hearts and strong hands," determined to save their favorite science, or sacrifice in the effort, resolved, for the purpose of protection, and as an evidence to the world of professional integrity, to form "The American Society of Dental Surgeons." Honor to those men! levelling the pretensions of the charlatan, and guarding the public against imposition, gathering the experience, and the wisdom, and the learning of the profession together, for mutual good and public benefit.

This association, then, is one of the *strong tests* of professional excellence; and if, with a knowledge of our society, the public should choose to employ one of whose pretensions they know nothing, they deserve all the evils that may grow out of their folly; because we are pledged by our compact to admit none to our fellowship, to grant our diploma to none, who are not thoroughly qualified to practise in every department of the art. Since an inducement to the really deserving practitioners, (and there are many who as yet have not united with us in our crusade against quackery,) to join with us in our undertaking: and if all who truly deserve well of their community would do thus, the public would then act advisedly in sending from among them, with scorn, the individual who could not furnish, *on demand*, the evidence of his competency, the credentials of his ability.

It is due to the reputation of honorable and high-minded practitioners, that have not united with us, that they *should* do so, and I must confess, when I hear of an individual, an ornament to his profession, objecting to our association, I am painfully compelled to believe his opposition to be the morbid growth of an ill formed jealousy.

Contrast a few years past with the present time, the state of dental practice at the period we are in, to that of twenty-five or thirty years ago; view the strange and conflicting theories of past times—theories indulged in by even the scientific, and compare

those expositions, those institutes of practice, with the *rationale* of the profession at the present day, and behold the triumph of our art.

The learned John Hunter could err; the professionally talented Fox could recommend that which the humblest member of our profession, acquainted with his business, would reject; the truly intellectual Bell might now have a lesson on practice read to him; the fancies of many a popular writer, in his day, would now be repudiated as unsound and unworthy: and how have these theories been exploded? By individual effort, truly, but individual effort directed to the enlightenment of the body.

How has dental surgery, stript of all the obsolete and injurious, been elevated to its high state of perfection? I answer, *by effort*, prompted by a noble disposition to rescue a valuable profession from odium; and although it is individual effort, working apart, yet moving a sympathetic chord in the bosoms of the enlightened members of our calling, to reduce to *system*, the principles of our profession, by furnishing a correct theory of practice.

If, without the aid of an association, individual effort has accomplished so much, how must we congratulate ourselves, when we behold the most eminent of our calling, uniting their wisdom and experience, to give tone, and character, and reputation to the science?

ARTICLE III.

Ulcerations of the Gums and Exfoliation of the Alveolar Processes of children—resulting from general debility or defective nutrition. By PROF. C. A. HARRIS, M. D. Surgeon Dentist, Baltimore.

THE gums and alveolar processes of children are occasionally attacked by a very peculiar and singular form of disease. Several cases of which, having come to my notice, I have thought that a description of it might not be uninteresting to the medical reader, and especially as it is a disease, that, if I am correctly informed, has never been noticed by an English or American medical writer. It has, however, been very accurately described by several

French authors,—particularly by DELABARRE, whose opportunities for observing it, in every variety of form, seem to have been very ample. The description given of it by him, accords so well with that of the cases which I have seen, that I shall quote what he says respecting it.

“There is a disease that is very rare among the wealthy, but very common among the indigent. It especially manifests itself about the period of the moulting of the temporary teeth. It is frequently observed on children that appear to be healthy, as well as on those of scrofulous or scorbutic affections.

“Can it be a peculiar disease still unknown? M. DUVAL has already noticed this disposition: and among the great number of children that are continually brought to the orphan asylum, I have frequent occasion to observe singular complications of this affection, which are modified according to the differences of the strength, sex, and idiosyncrasies of the different subjects. In some, the lips and gums are of a beautiful, bright red color; in others the lips are rosy, though the gums are pale; or both of them are reddish, and much swollen. Sometimes also the gums are pale and the lips of a deep red, there is besides no scorbutic or scrofulous symptoms; frequently the child is robust and appears to be quite well.

“It begins to experience troublesome itchings in the gums; they ulcerate around the necks of the temporary teeth, which become separated from them, and somewhat loosened. If the symptoms continue, the evil is propagated, a burning pain is felt in some parts of the buccal membrane that lines the cheeks; and ulcerations of a greater or less size are formed there. To these evils are joined some others—painful swellings in the glands that environ the lower jaw, the entire separation from the gum, and loss of undecayed teeth, whose roots are frequently surrounded with a yellowish mucous tartar. I have even known portions of the alveoli to exfoliate, and then the cure is effected almost naturally. Whatever may have been the importance and continuance of the local maladies, I have observed that, if children reach the seventh or eighth year, their second teeth are not deranged by the cause that occasioned the loss of the first; they are only badly arranged by reason of the want of development in the maxillary bone,

which shows that during the disease the general ossification is carried on but slowly."

The symptoms as here described by M. DELABARRE, correspond for the most part with those of the cases which I have seen, except that they present a somewhat greater variety; the color of the gums and lips in the cases that have come to my notice, were always that of a deep red, sometimes bordering on purple. The separation of the gums from the alveolar processes, was, in every instance, preceded by ulceration of their edges. The matter formed, was at first, muco-purulent, but afterwards become ichorous, and increased the irritation of the parts with which it came in contact. As the gums separated from the sockets of the teeth, it denuded them of their periosteum, and insinuated itself into the alveolar cavities and caused the destruction of their membranes.

The disease having arrived at this stage, necrosis and exfoliation of the alveolar processes soon followed—carrying away with them the deciduous, and sometimes the embryo adult teeth. In one instance four of the second teeth that had come through the gums were removed with their exfoliated sockets.

As it regards the effects produced upon the permanent teeth by this affection, they were in the few cases that have fallen under my notice, decidedly injurious. In some instances their enamels were covered with dark spots; in others they were corroded, and when the disease had occurred early in life, their bony structure appeared soft and chalky, and their liability to be acted on by chemical agents greatly increased. My observations, therefore, on this subject differ somewhat from those of DELABARRE's. He tells us that, "frequently the child is robust and appears quite well." In all the cases which I have seen, the general health was evidently affected, and in some very considerably. Usually, the pulse was small and quick, the skin dry and husky, the bowels constipated, much lassitude of body, and great disposition to sleep. These symptoms, however, I have never known to precede the local affection, but seem rather to have been symptomatic of it.

Continuing the subject, M. DELABARRE says, "Chilblains of a bad character are the portion of these children; their skin is terreous or wan, the flesh of some is soft, their eyes dull, their habit of body languid, and finally have true scrofulous obstructions

Believing that I have, in these cases, found that the general weakness depends on that of the digestive organs, whence result divers degrees of alterations in the vivifying properties of the fluids, I employ with success, bitters and tonic powders, such as Jesuits' bark, the small centaury, &c."

I would here just remark, that I have never met with an instance of this disease in which there was not evidently a scorbutic tendency of the general system, and am disposed to believe, from the very nature of the affection, that, although there may exist in some cases a scrofulous diathesis, that this always predominates.

"For the local treatment of the gums," says our author, "I recommend acidulated gargles, or those in which have been dissolved some grains of sulphate of zinc. If these means are not sufficient, I have the ulcerations cauterized every day with dissolved *argentum nitratum*. Many may be cured by these simple remedies; but I have sometimes been obliged to have recourse to the actual cautery, from which I have derived great advantage. Several, however, in whom the disease was very violent, have sunk under it, after having experienced the following symptoms:

"General swelling of the stomatic membrane, ulceration on one side alone, prostration of strength, slight pulse, redness of the affected side, avidity for food, burning thirst, then, at the expiration of three or four days, a gangrenous spot, resembling an anthrax either below the cheek bone or about the lips; rapid increase of the spot, which at first livid, becomes black the same day, and, when grown to the size of a five franc piece, separates in the middle, and forms an obstinate ichorous ulcer, whose pale edges roll upon themselves like flesh exposed to the action of a very brisk fire. The whole of one side of the face is soon entirely devoured; the bones are uncovered as well as the roots of the teeth, which, however, are not carious but fall out of themselves; a hectic fever consumes these unhappy beings, to whom death is too tardy a relief. This sad scene has passed before my eyes in the cases of two children, one of them eight, and the other a girl of nine years old. Death seizes them between fifteen and twenty days after the attack of the first marked symptoms, notwithstanding all the rational means employed, such as tonics and caustics. These are the characteristics, which an inveterate cancerous affection, with

all its horrible scent, would not exhibit. This affection has been so well described by M. BARON, that we cannot but profit by his reflections and try the means recommended to be employed by him in similar cases.*

"In general, the female sex is more subject to affections of this nature than the male. The dissections that I have made of several children, attacked with this disease, and in different stages of it, have always presented me the bones singularly softened. Those of the jaw, especially, are very easily cut with a scalpel. There is consequently but a very small quantity of calcareous phosphate in them, but their teeth do not appear to be the less hard on that account; on pressing the cutting edges of these, which have shot up, we perceive them bend, and, as it were, sink again into the jaws.

"Some authors, it seems to me, have referred this kind of disease to a sort of scrofula; but, for reasons, which I find myself compelled to detail, I do not believe this opinion can be adopted, because the seat of this last affection is in the lymphatic, whence it may be propagated to different systems, while the affection, the symptoms of which I have just described, has its seat in the *organs of nutrition; and, in the fluids that are conveyed to them*. Moreover in the beginning of the disease, there are no obstructions that can reasonably be regarded as of a scrofulous nature, but such may occur as it gradually progresses and propagates the disturbance in all the secretions.

"This vicious disposition, which I have frequent opportunities of observing in the asylum to which I am attached, is sometimes innate in children, and sometimes acquired by their suffering great privations of nourishment. In the former case they are melancholy, and grow for a long time without complaining of any pain; both their dentitions are very tardy, the bones of the jaws as well as those of all parts of the body, are exceedingly slow in their development, the membrane of the lips and mouth is pale, the saliva mucous; these children are meagre, their skin soft, which has led me to adopt the word *astheny*, to denote this state, for it designates the want of strength that exists in all the tissues of these little beings, whose nutrition is effected with extreme difficulty, with-

* Vide le Bulletin de l'Ecole de Medecine de Paris, 1816, page 136.

out there being any possibility of attributing the cause of it to a distinct disturbance of any organ, separately considered.

"There appears, therefore, a want of vitality in all the apparels which causes the child to waste away daily, and the natural functions to be performed with a sort of supineness. It has no appetite, is frequently constipated; at other times has diarrhoea, but no fever; it is timorous and nervous, has a melancholy air, and, in short, excites a sentiment of compassion. It seems as if sanguification could not be effected; for in these subjects the blood is very serous and almost colorless. After what has been said, it is not surprising, that the organic exhalents of the bones should not supply them with scarcely any calcareous earth, but with a material, that is without consistence, acidulated and rather destructive, than reparative.

"Exercise in the open air, generous wines, sometimes even a little alcoholic liquor, and a diet not exuberant, but consisting of succulent viands, form a part of the regimen, which, in these cases, it is indispensable to follow. It is necessary to prohibit milk and acid or aqueous aliments. To arouse the vitality, I have constantly and successfully employed, the *juice of cruciferous plants, the guinea in powders*, but with this last medicine I think useful to unite opium, which diminishes its action on the digestive organs.

"I banish the use of ptysans, which generally fatigue the stomach: vesicatories and purgatives are employed, but with much circumspection, and only when there is some reason for displacing an irritation communicated to some interior organ."

Having now quoted what M. DELABARRE says respecting this most singular affection, little remains to be said by me on the subject. In conclusion, however, I would observe, that none of the cases in which I have been consulted were of so aggravated a character as some of those which he has described. Except in three instances, in which exfoliation of the sockets of several of the teeth had commenced previously to my seeing the patients, the disease yielded to astringent, detergent and acidulated gargles, the application of *nitrate of silver*, in strong solution, to the ulcerated edges of the gums, aperients, tonics and a generous nutritive diet. The others were cured soon after the completion of the exfoliation of the dead sockets, by similar treatment and the restorative operations of the economy.

From the cases which have fallen under my observation, I have been induced to adopt the opinion advanced by the author whose remarks on the subject I have quoted, that the disease is the result of general debility, occasioned by privation or a want of proper nourishment, for its occurrence, so far as my knowledge extends, is always confined to the indigent. I am, however, at the same time, inclined to the belief, that it is favored by a constitutional tendency of the general system, though, notwithstanding DELABARRE seems to think otherwise, and that without this, other causes would be insufficient to produce it.

To the ordinary spongy and inflamed gums, or scurvy, or conjoined suppuration, as the affection is sometimes called, the disease in question bears but little analogy. That affection is the result of local irritation, favored, it is true, in many instances, by a general scorbutic diathesis, produced by salivary calculus, decayed or dead teeth, or roots, or a vitiated state of the buccal secretions, and its progress, compared with this, is very slow. In that disease, the matter that is formed by the suppuration of the gums is, in most instances, healthy pus, but in this, although at first it is muco-purulent, it soon becomes ichorous and intolerably offensive. The sockets of the teeth too, by that affection, are never suddenly laid bare, but by this they are often in a very few days denuded of the gums, deprived of vitality and caused to exfoliate. To the attacks also of that disease, all ages, classes, and conditions of people are liable, whereas, to those of this, the indigent alone are subject, and these only during the earlier periods of life.

Maryland Med. and Surg. Jour.

ARTICLE LV.

Address before the Virginia Society of Surgeon Dentists, on the evening of their first Annual Meeting, Oct. 11, 1843. By JAMES D. McCABE, D. D. S.

[Published by request of the Society.]

Gentlemen of the Virginia Society of Surgeon Dentists:—

THE duty you have assigned me, to address, at its first annual meeting, the Virginia Society of Dentists, might have been con-

fided to an abler exponent of your purposes, and the character of your cherished science, but I can confidently say, to no one who feels a deeper interest in your success, or who is more willing than your speaker to tax to the uttermost his abilities in support of your undertaking. Nearly twelve months of experience have passed, and I rejoice to see assembled around me to-day, the same faces that I saw at our institution, and others beside, all beaming with satisfaction, and noble determination, giving evidence of zeal, rekindled by the collision of mind, and emulation excited by mutual perseverance.

The present anniversary is full of rich auguries, and exhibits already the dawn of a brighter day to our profession, in this time-honored commonwealth; and though there may yet linger "some dregs of ancient night not quite purged off," along the orient of our hopes, yet may we confidently expect, that the persevering labors of the faithful and intelligent, will ultimately scatter the last cloud from the horizon, and shed a flood of healthful light upon the meridian of our success. It is at least a source of encouragement to those who have grasped the sickle of investigation and cheered their compatriots with the cry of improvement and reform, to know that in the field which spreads out before them, there are flowers of philosophy and rich fruits of wisdom, whitening to an abundant harvest, and promising amply to repay the faithful reaper in their fruitful fields.

That branch of science, gentlemen, in which it has been your pleasure to embark, and for the cultivation and improvement of which you are associated, is yet in its infancy, as a distinctly cultivated branch of the art of healing, though it ranks, in its origin and claims, with the oldest and most elevated divisions of its kindred branches. While surgery and medicine have arisen from their once humble vocation, and from the compounding of a few simples, and the setting of a fractured limb, became noble and expansive sciences, dentistry has been neglected, or else had its distinct character destroyed by being merged in the science of surgery, as part and parcel of its minor manipulations. Notwithstanding this has been so, it has its special claims to consideration, and a very few years have been sufficient to vindicate, in a good degree, its obscured claims, and to present it in its native excel-

lence, associated with every other branch of the science of healing; reflecting, in some degree, the improvements of each, and partaking in the great principles of all.

Dentistry presents to the view of its scientific votary, an extensive prospect, every visible point of which, when gained, presents a still increasing horizon. True, it professes to treat of the diseases of the teeth and gums, yet the various affections, both of a local and constitutional character, to which their diseases give rise, demand an acquaintance with the laws of the human system, its ills and antidotes.

Comparative anatomy, with its ever varying and interesting comparisons and observations, presents an almost shoreless ocean, in which islands, aye continents, abound, never yet pressed by the foot of a discoverer, or seen through the glass of the explorer; upon this ocean, the surgeon dentist may launch his bark in quest of scientific adventure, and spend a long life amid the ever increasing wonders that arise around him, in quick and varying succession, to reward his toil.

The learned labors of *Malpigi, Duverney, Lawrance, Winslow, Ritzius, Bertin, Jourdain, Hunter, Bichat, Cuvier*, and others, present but the imposing outline of a map of discovery, to be filled up by the discoveries of others; and to no branch of the healing art does this most interesting science more directly address itself, than to dental surgery. Special anatomy and physiology, with their deeply interesting developments, constitute another field of study, which, in order, should properly have been first adverted to. The disposition and arrangement of the various parts of the human system, a knowledge of the various tissues and their functions, both in the normal and abnormal condition, is absolutely requisite to one whose attention is directed to the treatment and cure of diseases which materially affect the whole economy, by derangements of the nervous system, and through the agency of the digestive apparatus, and alimentary canal.

Therapeutics, as embracing materia medica and the practice of physic, has also its claims for general acquaintanceship, together with a knowledge of chemistry, both analytical and synthetical. Another constituent in the character of a *well educated dentist*, is an acquaintance with practical surgery, and of consequence a

good degree of tact in mechanics, in order that he may understand the treatment of existing disease, and be prepared, in a skilful manner, to remedy the loss of such valuable organs as the teeth, by supplying artificial substitutes.

You will perceive, gentlemen, by this very cursory view, (do I place the standard too high? I think not,) that the profession of dentistry is not what a great many have supposed it to be, that of (to use the language of a wit) "a mere mouth carpenter and tooth joiner;" or what many who have called themselves by its name have made it, but a branch of that noblest of all sciences, which has for the subject of its investigations, MAN, in all his relations and conditions in life and in death. That I have not estimated the qualifications for practice too high, is most obvious when we consider that the best performed operations in dentistry, where mere mechanical skill is concerned, will, under certain conditions of the system, prove decidedly injurious. *Let me not, however, be misunderstood, or for a moment considered guilty of the glaring inconsistency of asserting that, in the common use of that term, the most finished medical education will qualify a man for the practice of dentistry!* There must be superadded that particular study, and artistical tact, which specially belongs to our art, without which no man should dare assume its responsibilities. It is a most notorious fact, and from it our art has deeply suffered, that some of our most distinguished medical men are grossly ignorant of the first principles of scientific and skilful dental practice.

It is true, the dental practitioner is not called to tread the loftiest path of medical responsibility. It is not his vocation to keep sad vigil beside the couch of death; to count the ebbing strokes of life's failing tide; to utter the fearful words, which, like ice-bolts, rive the heart; or speak the blessed accents of encouragement and hope, that clothe the pale countenance of the midnight watcher with smiles; yet, in the sphere of his duty, the responsibility is immense, his malpractice may prove the proximate cause of maladies, the responsibility in the treatment of which, the divisions of science compel another to assume.

Viewing dentistry, therefore, as an important branch of science, we may well be astonished at the abuses and charlatanism with

which it has abounded, and the apparent neglect with which it was for a long time treated. When surgery was released from the hands of the ignorant barber, and elevated to its true position, it seemed by general consent conceded, that he whose high function it was to remove the superfluous hair from the face and poll the head, was well qualified to take under his protection the teeth, and though a series of efforts were made to show the importance of elementary knowledge, and proper skill in the management of these delicate organs, by such men as *John Hunter, Sydenham, Astley Cooper, Bell, de Blainville, Richerand, Rush, Fox, Goode, Hooper*, and other writers of distinction, still was the subject regarded as comparatively unimportant by the mass of medical men, and left to struggle for existence, if not entirely in the care of barbers, in the hands of those equally barbarous. Some skill in the mechanical use of tools, and in introducing metallic filings into the cavities of carious teeth, was considered by medical men themselves, sufficient to qualify one to enter upon the treatment of disease in organs among the most useful and delicate in the human system. The result was, *plenty of work for the doctors*, in broken constitutions, and a long catalogue of nervous affections. Even to the present day, the text-books in anatomy and physiology, used in our medical institutions, contain gross errors, founded upon long exploded doctrines with relation to the teeth, a circumstance for which we cannot furnish a rational solution, unless it be found in the comparative indifference with which the subject is regarded by most of the exclusively medical writers.

These facts furnish grave and sufficient cause, if there were none other, why dentistry should be zealously cultivated as a distinct branch of the healing art, and why those who appreciate its dignity and importance, under the present state of affairs, should associate, as you have done, to develop its resources and establish its well ascertained principles of practice for the mitigation and removal of those complicate and distressing affections, which destroy the health, and mar the beauty of the human face divine. Dr. James Johnson, of the "Medico Chirurgical Review," writing on this subject, very justly remarks, "there appears to be more valid reasons for dental surgery furnishing a sort of separate art, than for the surgery of the eyes and the ears being made so.

In the former, much mechanical contrivance is requisite, so much so as to render it exceedingly improbable that any but a special artist could excel in it; but the operations for the eyes and ears can be as well performed by a dexterous surgeon as by an oculist or an aurist." And I may add to this expression of opinion, that until dentistry was cultivated with the energy and zeal demanded by a "separate art," the most wild and ridiculous vagaries were indulged in by eminent men, with regard to the teeth.

Aristotle, that universal genius of antiquity, declares most positively, that men have more teeth than women, and, that this is the case with several other animals. This furnishes an evidence of the inexact manner of the philosophy of former times, leading men to assert, *ex cathedra*, as fact, what the slightest examination of every recurring fact would have convinced them was no fact at all. Perhaps, however, this philosopher thought with Homer, that the teeth were "barriers opposed by nature to slips of the tongue and the abuse of speech," and, as the ladies indulge more freely in the exercise of the unruly member, he therefore concluded that nature had furnished fewer barriers to its exercise.

Pliny, who doubtless speaks the opinions of the scientific of his day, assures us, that "the human teeth contain a *poisonous virus*, and that a bite from them will destroy weak animals."

Thomas Bartholin, of a more modern age, and who ranked high as anatomical authority, declares that he saw a man in whose jaw grew an *iron tooth*, and he actually enters into an argument to prove that it is reasonable. This is but a very brief specimen of the wholesale absurdity, which, in every age, distinguished writers upon the teeth, from Hippocrates to Blake; and, in some instances, even since the latter period, referred to. We learn from undoubted sources, that the teeth attracted attention at a very early period of time; and that they were classed in their treatment, as a separate division of the healing art, from medicine and surgery, is evidenced by the declarations of the most distinguished Greek, Roman and Arabic writers. When ancient Memphis reflected the glories of the Pharaohs, and Thebes, which even now in ruin arrests the admiration of the traveller, was still in its infancy, when its hundred gates poured its tides of population out, and its marts echoed to the hum of industry and

trade,—when the mountain tombs of its kings were tenantless, and its young glory undimmed, our art was cultivated ; and, with its kindred sciences united in conferring benefit upon man, and by attracting attention to its demands, laid the foundation of its future usefulness. Among the nations which succeeded to the scientific glory of Egypt, it continued to be noticed, though not always with equal complacency with its kindred branches. Through the long night of barbarism and ignorance, in which the Latin empire expired, and until the revival of letters in the west of Europe, it found a home, doubtless with science, in the cloistered home of the cowed priest, and was by him practiced in its simpler operations as a minor part of surgery, until the council of *Tours*, in 1163, issued its decree, forbidding the shedding of blood by the ministers of religion, by which the priests were compelled to desist from any pursuit involving loss of blood to their patients. "*Ecclesia abhorret a sanguine*," "the church holds the shedding of blood in abhorrence," was the language of the council, and the abandonment of surgery by the monks removed the only barrier to the preferment of attendants on baths—barbers—mountebanks and ignorant itinerants ; and surgery, which at that day consisted almost entirely in blood letting and tooth drawing, became, in a special manner, the pursuit of the barber ; this class of persons were legally incorporated in several countries of Europe, under the designation of "*barber surgeons*." In England, especially, they continued their vocation until the reign of George III., when they were suppressed by legal enactment. In some countries, to this day, they continue their pursuits.

Within the last fifty years, dentistry has been cultivated with more ardor, and determination ; and it is only within that time that it may be said to have assumed any thing like a respectable standing, either in England or on the continent.

To the labors of the indefatigable Blake, we may mainly attribute the increased importance of the science, and while we may be called upon to divide the laurel between him, Fox, and John Hunter, the largest portion of that wreath, in this department of practice, must forever adorn the modest brow of him, who labored in performing the manipulations for which his genius furnished the rules. I would not dare to essay to pluck one gem

from the crown of the immortal Hunter, he stands solitary and alone in his glory, the greatest mind of his age, like some lone brilliant star in the mid heavens, lighting up with its beams the surrounding gloom. Uneducated, and without the previous preparation so important to secure success, he grasped the torch of investigation with untrembling hand, and boldly led the way through the mazy labyrinth of science, and in the memory of his almost incalculable achievements, *has* left behind him an incentive and example to the determined wooer of knowledge, of what may be accomplished by industry and perseverance, demonstrating in his whole life, the assured truth, that wisdom has inscribed on the door of her temple the universal invitation, *enter!*

Much, however, as we may justly owe to the writers and practitioners of the old world, it was nevertheless reserved for the profession in the United States to give an elevation and character to dental surgery, to which it had not previously attained, which in its progressive developments, is destined to give it *caste* with the most perfectly cultivated sciences. The very abuses to which it was exposed for years, in this country, tended to effect the very improvements of which we boast, and introduced the instrumentalities for its permanent benefit.

The parent of all these abuses was the easy access to the profession, occasioned by the small importance attached to its manipulations. The surgeon and physician, united with the public, in declaring, that a small degree of mechanical dexterity was alone demanded in the performance of the necessary operations indicated by the disease of the teeth, and this notion, based upon the supremely ridiculous doctrines which so extensively prevailed at one time, teaching the almost entire disconnection of these organs from the dependencies and sympathies of the general system, induced countless numbers to embark in the profession of dentistry, who, in the commencement of their professional career, were scarcely equal to the duties demanded by the erroneous opinions entertained of the necessary qualifications. But, among these numbers, there were some master minds, who actuated by a noble ambition, and emulous of distinction in their calling, gave a new impulse by their industry to the neglected science. These persons would never, doubtless, have dreamed of engaging in

dentistry, but for the low estimate of its requirements which then extensively obtained, yet having engaged in it, they brought all the power of strong minds, and persevering industry to the investigation of its principles, and by their unwearied diligence, became the conservators of a noble science, and the benefactors of the human race.

We cannot regard the giant strides with which our art has marched on to eminence in the last few years, without experiencing feelings of the most lively gratitude to those, who, with minds well disciplined for the work, have stood in the front rank of the profession, raised its soiled and degraded banner from the dust, and given its ample folds to the breeze, with the cheering cry of—onward!

The genius of science has enrolled their names upon her imperishable tablets, and has awarded them a niche in the pantheon of her glory, alongside the noble spirits of the past.

I trust I may not be deemed invidious, or charged with an attempt to detract from the just merit of others, if I follow alike the dictates of friendship and of justice, in attributing many of the successful efforts to elevate our profession, in the United States, to the indefatigable labors of Dr. C. A. Harris of Baltimore, and his co-laborers, Drs. Hayden, Brown, and Parmley. Of Dr. Harris I may speak from the knowledge of years, derived from the closest and warmest personal and professional friendship. I *know* his unwearied labor for the advancement of his profession in respectability and standing—his industry as a writer, often at great sacrifice of ease and interest—his ardent efforts for the institution of instrumentalities and facilities for the cultivation of "*the dental art*," such as has been furnished by the American Society, and Baltimore College. Whatever others may have done, and they have done much, very much to advance this cause, Dr. Harris must be regarded as the master-spirit of the enterprize, the devoted, the ardent friend of the profession. An accomplished practitioner, urbane and gentlemanly in his deportment, he occupies a position in the college he assisted in founding, which the interests of the science demands, and to which his own modest worth entitles him. I hope this digression, if it is so regarded, will be pardoned, in view of the justice attempted to be done to those to whom we owe so much as a profession.

The establishment of the American Society of Surgeon Dentists, presented a new era in the history of the profession; attracted by its utility, the extremes of the country have been united, and a mass of intellect and professional talent brought together in contact, which by collision, is like the smitten steel, annually scattering its scintillations of wisdom through the length and breadth of the land. Its published transactions present a voluminous exhibition of skill, and professional observation, and is full of bright auguries of the future. Already, in the few short years of its existence, has it raised the standard of dental requirement and professional education, and this effort, aided as it now is, by the establishment of the Baltimore College, in its healthful effects upon the future, will bring a bright day to dentistry in the United States. Already has this effort been felt across the Atlantic, (and to the honor of America be it said,) in the publication of a dental journal, and a determined effort to form a national society of dentists in the metropolis of the British empire, thus presenting two great nations engaged with generous emulation in the cause of science.

The formation of the Virginia Society, adds another link to the chain of improvement and reform, and as the devise of the seal you have selected indicates, the sun has at length arisen upon the old dominion, scattering the gloom of ignorance—the night of quackery and empiricism.

The great question for this society to determine, so far as its relations with the public are concerned, is the advantage, mutual and reciprocal, to be derived from its formation. Without being too prolix, it would be impossible on this occasion to do justice to this question, a very cursory view of its solution must suffice.

The first great advantage to be derived from its formation will be found in the union effected among the members of the profession, and the personal contact into which they will be brought, for we should be doing injustice to its honorable and scientific members to suppose that any *one of them*, will withhold his influence from the enterprize. The acquaintanceship thus formed, and the mutual consultations to which it will give rise, while they serve to elicit the result of much experience and observation, will, in their obvious tendencies, awaken an *esprit du corps*, and es-

tablish an united effort for the highest grade of professional education allowed by our art. I think that I may hazard the assertion, that there are no body of men in our state who can lay claim to higher attainments, or more thorough qualification for the pursuits in which they are engaged, than the *majority* of dentists; if, therefore, we can bring these scattered parts together, and unite them into a well organized body, the sole object of which is to elevate the science, and diffuse intelligence; our subsequent labor will chiefly consist in giving proper direction to our efforts, and we shall have laid the foundation of permanent usefulness.

It seems to comport with the genius of our free institutions, that great public benefits are most effectually secured by associations for their prosecution; heresy in church and state, in science and letters, individuals of kindred pursuits, are wont to unite for the advancement of great enterprises, bringing the united energy of the many to accomplish what would of necessity fail, if solely dependent upon individual exertion.

In a profession like ours, as it has for years been constituted, the voice of the solitary reformer is lost amid the din of professional jealousies, and the pride of professional opinions. What uttered by one, would be regarded as heresy, or an attempt to obtain professional reputation, spoken by the many, assumes the tones of an oracular voice, and finds in the listeners, willing disciples to its teachings; this then is an advantage derived from association, and its name is *legion*.

There are many evils to be cured, and abuses to be corrected, before we can realize the full amount of good, attainable by our union, and these evils and abuses necessarily grow out of the want of a well regulated and sound system of professional education; to effect this desideratum, will constitute an important and indispensable first step in our operations. We must demonstrate to community, that dentistry is not what ignorance has too long regarded it to be, an unimportant branch of surgery, which can be safely confided to ignorant operators. That the dentist has to do with *living* organs of the human system, and that a knowledge of the structure and functions of that system must form the basis of all rational practice; to effect this, our annual transac-

tions should present a volume of practical information, derived from the observation and experience of our members;—not only so, but the undivided influence of our union must be made a barrier to the entrance of any one into our profession who is not qualified for its duties, and who is not possessed, at least, of the elementary knowledge of science and letters, which will qualify him, by patient industry, to add to its respectability, and to increase, in the course of time, its stock of useful professional knowledge. In the discharge of this high duty we should know no man after the flesh; the interests of community are in some degree in our keeping, and while we are conscious of the responsibility, we should labor diligently to acquit us in the delicate and highly responsible trust. There is one important consideration, however, which merits our most serious attention; while quackery and empiricism should at all times be frowned down, and exposed, we should be exceedingly careful *not* to assail professional reputation, or discountenance our brethren, because of difference of opinion. It has been too common for persons calling themselves dentists, sadly to forget, that a prime constituent in that character, is gentlemanly feelings and deportment, or that slander, prompted by narrow feelings of professional jealousy, is a *moral felony*, which, in the estimation of all honorable minds, excludes its perpetrator from the association of the virtuous and the good. I have always found, and my experience is confirmed by the observation of others, that he who is willing to trifle with the reputation of another member of the same profession, or lessen him in the estimation of the public, is either an ignorant quack himself, or grossly deficient in the practice of common honesty. You will always find that a practitioner of any science, if by education qualified for his profession, and by habits of association and principle, a gentleman, is extremely loath to censure the practice of another, however much he may differ from that other, unless a sense of public justice demands it at his hands. Much will have been gained by our association, if we effect the removal of this grave evil. If we are called upon in the legitimate exercise of our professional duties to expose quackery, let us do so with firmness and decision, without ostentation or coarseness, recollecting that no act by another, however disgraceful, will ever justify in

the exposure, the use of vulgarity or imperiousness, by which the dignity of character may be compromised, and especially should we be so prepared to expose such things, as not to be guilty of the crime we charge upon others. There is another very important end to be obtained by our association, which will be secured by an union of action, to discountenance, that most disreputable, and to a sensitive mind, disgusting system of professional puffing, often resorted to by members of our profession, for the purpose of promoting selfish ends; the most gross and impious frauds are, by this means, practised upon the public credulity, by long and windy professional cards, supported by an array of names, as recommendations, calling attention to new materials for plugging, new modes of artificial insertion, patent instruments for the extraction of teeth, and divers other strange things known only to the advertiser. I have always regarded such cards as evidence of ignorance and charlatanism, and their perpetrators a disgrace to a noble art. Gentlemen of this feather are always ambitious of distinction, to which they seek to make their way by the unmeasured abuse of every body but themselves; *and if as is often the case, (as I am told it is,) they can purchase the honorary degree of M.D. for THIRTY DOLLARS, without being able to distinguish a tincture from a decoction, they parade it as a suffix to their names, and turn up their noses at those who are too honest to wear honors to which they feel themselves unentitled, or to assume names and titles that do not properly belong to them.* I was much amused by an anecdote related to me by a medical friend, in the lower country, of one of these mountebanks. He had extracted a superior molar tooth for a gentleman, who became much alarmed at an excessive hæmorrhage which supervened; after some hours had elapsed, he sent for *the dentist* to know what should be done to stop it; he very gravely informed him that it was necessary to *take up the bleeding artery*, which he proceeded to do, by passing a cotton thread through the edges of the gums and drawing them together; unfortunately for his reputation, the cure was not completed, the bleeding continued, and the physician who related the circumstance to me, was called in, who by removing the ligatures, and applying the compress, succeeded in "*the old fashioned*" way in arresting the hæmorrhage.

Against these things, it behooves the reputable members of the profession to record their unchangeable disapprobation, as I feel assured they have always done in their individual capacity, but much more should it now be done by the voice and sanction of their associated wisdom.

There are a number of other evils which our association will have a tendency to cure, and though we may be deprived of legislative aid, in the form of corporate existence, unitedly acting, we will suffer but little from its absence; the public will accord to us, all that the exceedingly wise law-makers have refused, and a consciousness of the rectitude of our actions will be our rich reward.

One great and absorbing object of our association, has been declared to be, the furnishing of a sound system of dental education, and to this we should most actively address our exertions. The literature of our profession is most rapidly and ably increasing, and in the United States, we can boast the best practical writers of the last century; it behooves us then, in the absence of a school of dentistry in our own state, to throw the weight of our whole influence in the scale of the Baltimore College, and at the same time to prescribe such text-books to those who intend presenting themselves before our board of examiners, as will enable the society to test most fully the qualifications of all upon whom its honors are conferred. Upon the proper management of this department of the society, will mainly depend its respectability and usefulness. While I would be the last person on earth to offer any inducement to a student to omit any advantage of which he can avail himself, in completing his education, but would urge every young man desirous to enter the profession, to avail himself of the advantages offered by THE ONLY DENTAL COLLEGE IN THE WORLD; I would nevertheless counsel an effective organization of that department of our society, that we may, in some good degree, subserve the interests of the profession, by furnishing the facilities for graduation to those who have more merit than means, to entitle them to the honors of our art.

You know, gentlemen, that at this day the obtainance of a degree, and the possession of a diploma, are thought to confer but little honor, from the facility with which they can be procured;

it will, therefore, depend upon the *diligence* and *care* with which the examinations of this society are conducted, whether its parchments are considered more valuable. Let the profession, let the world know, that no candidates will be recommended by the committee, for the honors of the society, unless he is qualified, morally as well as professionally, for our association—that his character as well as his attainments will have to pass the tests of the severest scrutiny, before he receives our certificate of competency, and is sent forth as a qualified dentist. Let this course of policy be pursued, and maugre the acts of *pseudo* law makers, our dear old Virginia will have taken the front rank in the glorious efforts now making for the diffusion and maintenance of a sound system of scientific professional knowledge; upon the glittering spear she wields, shall perish the miserable charlatanism with which the art has been cursed, and her sons shall go forth from our halls, like *Pallas* from the brain of Jupiter, full armed for conflict with the hydra of dental disease.

To the young gentlemen who have presented themselves for examination, and who have passed most honorably the ordeal of your able committee, I may be permitted to say a few words of advice and congratulation.

The profession you have selected, and to which your attention has been closely given through the period of your students' probation, is highly honorable—none can present objects of more interest to engage the human mind, or afford a larger field of intellectual pursuit; it at the same time confers fearful responsibility. It would be unnecessary to say to you, fresh as you are from your text books, and familiar as your examination has proven you to be with the principles of the science, that vast and imminent consequences depend upon the skilful and faithful performance of your professional duties. In your intercourse with your fellow citizens, be known only as instruments of good, in removing pain and contributing to the preservation and health of the beautiful organs entrusted to your care. Recollect that you will never cease to be students, every day will add a new page to the volume of experience; patient observation, and the judicious classification of the facts from which you will deduce your practical rules, will demand at your hands, patient and unwearied industry; if, for a

moment, you are disposed to relax your efforts, let a sense of self-respect, and professional dignity, connected with your responsibilities, re-nerve your minds and strengthen your resolves. Be actuated by a noble ambition to be first in your profession, if labor and study will make you so. This is the only, this the highest evidence we ask to satisfy us that you are worthy the distinction we have conferred, the confidence we have reposed. I congratulate you upon your preferment, and speak the feelings of this whole society, when I give you a most hearty welcome into the ranks of the profession.

Gentlemen of the Virginia Society, I have thus briefly and hurriedly presented the topics which seemed to me most proper for your first annual address. In doing so, I have studied great plainness, and, so far as I could, studiously avoided ornament; I have been too anxious that we should gather the *fruit* of our toils, to amuse you with the *flowers* that might have been gathered by the wayside, for our profession is not barren of themes to awaken the pride of oratory, and call forth the eloquence of song; yet must we essay to remove the rubbish which obscures these latent beauties, ere we wreath our altars with roses, or challenge the song of the minstrel to celebrate its beauties. To rejoice in triumph, belongeth to him who putteth off his armor, not to him who has just put it on, and is about to go forth to battle. During the past year much cause of gratulation has been afforded you in the approbation of your friends, the friends of science; they look upon your labors with the deepest interest for your success; and I feel well assured that they will be gratified with the result. The germ you have planted, I doubt not, will become a noble tree, bearing healthful fruit for the healing of the nations. The handful of corn you have scattered upon the mountain-top will produce an abundant harvest of golden grain, the rich sheaves of which will be cut, bound, and garnered by generations yet to come.

Difficulties may lie before you, but they will be removed, while around your pathway, freed by your own hands from various weeds and poisonous reptiles, shall bloom in rich exuberance, flowers of usefulness, and the rich fruitage of success; while ye yourselves, engaged in doing good, and laboring to fill up the measure of your days in usefulness, will go down to your graves

in peace, the smiles of God around you, and in your bosoms man's holiest, richest treasures, a peaceful conscience, and the hope of endless rest.

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ARTICLE V.

*Transactions of the Virginia Society of Surgeon Dentists*, at their Annual Meeting, held in the office of DR. SAM'L LETHBRIDGE, in the City of Richmond, October 11th, 1843.

At 11 o'clock, A. M., the President, DR. S. LETHBRIDGE, took the chair. The Secretary called the roll, and read the excuses of absentees. The proceedings of the last meeting were read.

A vacancy having occurred in the Examining Committee, in consequence of the absence of some of the members, on motion, the said vacancy was filled by the appointment of Drs. JOHN G. WATT, S. M. SHEPPARD and J. W. SHEPPARD.

The Examining Committee reported to the Society the name of SOLOMON ANGLE, who had been rigidly examined, on the theory and practice of Dental Surgery, and who they recommend to membership in the Society, and to the degree of D. D. S.

*Afternoon Session.*

The committee appointed to address DR. R. N. HUDSON, asking explanation, in relation to certain opprobrious remarks, involving character before the Society, made the following report :

"The committee appointed by the Virginia Society of Surgeon Dentists, to investigate certain charges alleged against Dr. R. N. Hudson, a member of said Society, beg leave to report, that having examined the testimony upon which these charges were founded, and politely and respectfully offered him an opportunity of vindicating himself, which he most *rudely* and abruptly declined; thereby, in the opinion of the committee, *tacitly* acknowledging the truth of the allegations in question; in consideration of which fact, in connection with the character of the evidence adduced, the committee beg leave to suggest the expulsion of Dr. R. N. Hudson from membership in said Society.

Signed, W. W. H. THACKSTON, Chairman.

*Wednesday, Oct. 11th, 1843."*

Whereupon, it was

*Resolved*, That the name of DR. R. N. HUDSON be stricken from the roll of members for contumacy.

*Evening Session.*

The Society assembled pursuant to adjournment at 4 o'clock,  
P. M.

The President called to order. The Treasurer presented his report, which was approved and ordered to be filed with the papers of the Society.

On motion of DR. S. M. SHEPPARD, the Society proceeded to the election of officers for the ensuing year, when the following gentlemen were declared duly elected :

DR. SAMUEL LETHBRIDGE, *President.*

" JOHN G. WAYT, *Vice-president.*

" JAMES D. McCABE, *Cor. and Rec. Secretary.*

" S. M. SHEPPARD, *Treasurer.*

" W. W. H. THACKSTON,

" JOHN McCONNELL,

" S. B. HAMBLIN,

" JOHN W. SHEPPARD,

" WM. N. McKENNEY,

} Executive, Examining  
and  
Publishing Committee.

On motion, DR. W. W. H. THACKSTON was elected, and requested to deliver the Annual Address, at the next Annual Meeting.

The following gentlemen were appointed to prepare Essays to be read at the next Annual Meeting of the Society, it being left to themselves to select subjects. DRs. J. G. WAYT, J. McCONNELL, J. M. SHEPPARD, JOHN C. McCABE, S. ANGLE, S. LETHBRIDGE, JAS. D. McCABE, and W. C. CRUMP.

On motion of DR. JAMES D. McCABE, the following resolution was adopted :

*Resolved*, That this Society, as a token of their high esteem for the distinguished professional labors and personal merit of PROF. C. A. HARRIS of the Baltimore College of Dental Surgeons, create him an Honorary Member of their body ; and that he be furnished with the Society's diploma, without the usual fee.

On motion of DR. W. W. H. THACKSTON,

*Resolved*, That as an evidence of the esteem of this Society for the professional and personal merits of PROF. H. H. HAYDEN of the Baltimore College of Dental Surgeons, create him an Honorary Member of their body, and present him with the diploma of the Society, without the usual fee.

The Annual Address was then pronounced before the Society, by DR. JAMES D. McCABE.

DR. W. W. H. THACKSTON read an Essay on the "Morbid Effects of Diseased Teeth upon the Human System."

On motion,

*Resolved*, That DR. McCABE be requested to furnish a copy of the Annual Address, delivered before the Society this evening, for publication in the American Journal of Dental Science.

On motion,

*Resolved*, That DR. W. W. H. THACKSTON be requested to furnish a copy of his Essay, read before the Society this evening, for publication in the American Journal of Dental Science.

On motion,

*Resolved*, That the thanks of the Society are due to the President, Vice-president, Secretary, and Treasurer, for the able manner in which their duty has been discharged.

On motion,

*Resolved*, That the thanks of the Society be presented to the Examining Committee, for the able firm and intelligent manner with which they have conducted the examinations at this meeting.

On motion,

*Resolved*, That the committee appointed at the formation of this Society, to procure a seal, be, and are hereby instructed to procure and superintend the engraving and printing of a copper-plate diploma, for the use of the Society.

On motion,

*Ordered*, That the next Annual Meeting of the Society be held in the town of Petersburg.

On motion,

*Ordered*, That this Society do now adjourn to the second Wednesday in October, 1844.

S. LETHBRIDGE, D. D. S., President.

JAMES D. McCABE, D. D. S., Cor. and Rec. Sec'y.



## Collectanea.

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*The Tartar on the Teeth.\**—A soft substance, of a whitish or yellowish color, is habitually deposited upon the teeth, and sometimes becomes firmly fixed to them. This substance may accumulate in greater quantities, and growing firmer by degrees may form the hard and dry concretion known under the name of tartar. It increases in bulk by the fresh layers deposited on its surface. According to an analysis made by Vauquelin and Laugier, tartar consists of sixty-six parts of phosphate of lime, nine of carbonate of lime, fourteen of animal matter, (of a yellowish white, different from the gelatine of bones,) and three parts of oxide of iron and phosphate of magnesia. Other chemists have found the proportions different; sometimes the phosphate of lime was more abundant, and sometimes the animal matter (or mucus.)

Authors have been much occupied with the manner in which this substance is produced. Is it a secretion, as some have written? Is it a deposit of the earthy salts contained in the saliva, and precipitated by a chemical agent, as medical books have reported for ages? Is it an earthy exhalation from the capillaries of the blood, to which the mucous membrane of diseased gums is prone?

Not one of these hypothesis has been proved; not one has the sanction of direct experience. Moreover, they are all sufficiently refuted by the following investigations into the composition of tartar.

It results from the experiments of M. Mandl that tartar is nothing but a deposit of the skeletons of dead infusoria, agglutinated by dried mucus; nearly as certain earths, according to the researches of M. Ehrenberg, are composed almost entirely of fossil infusoria.

In fact, if we take some of the mucous matter which is accumulated upon and between the teeth, and dilute it with a little distilled water previously warmed, we shall immediately perceive a host of infusoria, which move about with great liveliness. Their size varies from 1-500 to several hundredths of a millimetre; and their shape is the same as that of the infusoria described by authors under the name of *vibriones*.

The presence of infusoria in mucus was pointed out by Leuwenhœk; but M. Mandl sets forth in all their details, the shape, liveliness, and other qualities of these infusoria.

These animals also exist in great quantity in patients who have been

\* Read by M. Mandl at the Academy of Science.

several days on low diet. They also constitute the greatest part of the mucous coating of the tongue in persons whose digestion is disordered. (According to an analysis of M. Denys, the chemical characters of this coating agree with those of tartar.)

After having ascertained the presence of infusoria in the mucus of the mouth, M. Mandl tried to find out whether these animals assist in forming the tartar also. For this purpose he softened a particle of tartar in a drop of water for twenty or thirty minutes, and after compressing it between the two pieces of glass, he distinctly saw that the tartar was composed of dead vibriones, of different sizes, but generally measuring several hundredths of a millimetre, united by an organic substance (dried mucus) the quantity of which is variable. The tartar is often almost entirely composed of these vibriones.

Hence it follows that these vibriones are provided with a shell, or inorganic skeleton [*squelette inorganique*,] since tartar is found consisting entirely of these vibriones.

This shows, too, why cleanliness, and the use of tonic or alcoholic fluids, prevent the formation of tartar by preventing the production of the infusoria.

To recapitulate, it appears:

1. That there is a great number of vibriones in the mucus which accumulates around and between the teeth.
2. That tartar arises from an accumulation of dead vibriones, and consequently cannot be considered either as a calcareous substance deposited by the saliva, or as a peculiar secretion.

This discovery of the composition of tartar is as new with reference to Leuwenh  ck's observation, as the researches of Ehrenberg touching the composition of diluvial soils were new in reference to the well-known fact of the existence of infusoria in water.—*Gaz. Medicale, but now from Boston Med. and Surg. Jour.*

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*Continental Treatment of Neuralgia.*—Dr. Schleiser, of Peitz, has prescribed, with success, to patients with abdominal neuralgia, but whose circumstances would not permit of their visiting a watering-place, the use of an artificial mineral water, resembling that of Eger, in Bohemia, and made as follows:—*R. Filtered spring-water*, a pint; *diluted sulphuric acid*, two drachms and a half; *hydrochloric acid*, twenty drops. Mix, and add *bicarbonate of soda*, forty-five grains. The bottles are then to be sealed up without delay, and kept cool; one or two pints may be drunk daily. In hepatic neuralgia, Dr. Schleiser depends much on the effects of belladonna; in cases where great irritability of the stomach is present, he finds nitrate of silver suitable, combined with morphia.—*Rust's Magazine.*

Morphia has been an ordinary remedy for neuralgia, the cure of which it may, in certain cases, effect; but a French practitioner, M. Rougier, has advised the adoption of an ingenious method, which he says will prove the

completeness and permanance of the cure. After the apparent removal of the disease by the morphia, he administers successive small doses of strychnia, gradually increasing the amount of the doses and abridging the intervals between them. Now, if the cure have been complete, the tremors and other characteristic effects of the strychnia go on diminishing in intensity from the first, notwithstanding the increasing strength and frequency of the doses; but if otherwise a contrary result happens, and the effects of the strychnia increase in intensity.—*L'Experience*.—*London Lancet*.

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*Neuralgia from Sympathy with a Diseased Tooth*.—A woman, twenty-seven years of age, was accustomed to be awakened at night with a sharp and lancinating pain—in fact, tic douloureux—in the left cheek, which extended to the temple, to behind the ear, and along the anterior border of the trapezius muscle. An hour or two in the morning, during which she slept, appeared to be the sole respite she had from pain. All kinds of rubefacients and narcotics were employed without any more than momentary benefit, when it was perceived that the second molar tooth was carious, and after some delay, it was extracted, when all the pains immediately ceased. Only the enamel of the tooth had been decayed; its roots were sound.—*Gazette des Hopitaux*.—*London Lancet*.

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*Dental Ingenuity*.—By turning to some of the back volumes of this Journal, an account may be found of the case of Jeremiah Driscoll, of Warren, R. I., who was injured, in the South Pacific Ocean, by a whale, Nov. 7th, 1836. It is only necessary to repeat the fact, that the end of an ear was driven into his mouth, in such a manner as to knock off the whole anterior part of the alveolar arch of the upper jaw, teeth and all; the roof of the mouth was broken through, and the nasal cavity freely admitted the tongue into it—the bones having subsequently come away. This is only a general outline of a terrible wound, from which Mr. Driscoll finally recovered, but greatly disfigured, and wholly unable to masticate food. By the skill of a Boston dentist, Dr. Harwood, now residing at Machias, Me., the deformity was measurably overcome, and the ability to subsist on solid aliment restored to him by a complete set of teeth.

Four years, however, have considerably modified the shape of the mutilated jaw, so that there was considerable difficulty in maintaining the palate plate in its proper position. Consequently, articulation as well as manducation was beginning to be an exceedingly troublesome process, to say nothing of the distortion of features that must necessarily ensue from any imperfection in the mechanism of such an extensive artificial surface as he had been wearing. Under these circumstances, he has again recently visited Boston for assistance. Dr. Joshua Tucker, whose ingenuity has often been

put in requisition in cases equally perplexing, succeeded in admirably fitting a new palatine and alveolar arch, bearing a highly finished set of molar and incisor teeth, which have as perfectly restored Mr. Driscoll as it is possible for art to do. No one would suspect, without a minute examination, that so much of the man was artificial.

These triumphs of art, of such immense importance to those who have been unfortunately maimed, should be extensively circulated by the press, that all sufferers may avail themselves of the advantages accruing from the modern discoveries and improvements in mechanical dentistry.

*Bost. Med. & Surg. Jour.*

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*Advantage of System in Medical Inquiries.*—"I advise a systematic arrangement in each case; observe the state of the pulse and skin; feel the head (in insane patients) whether it is hot all over, or in one part only; whether the extremities are cold; whether the tongue is loaded and dry; whether the bowels are open, the urine free, and if the patient be a female, whether the catamenia are regular. Next observe the breathing and the action of the heart, pass your hand over the right hypochondrium, and feel whether the liver be enlarged, or whether the abdomen be distended with flatus, and whether there be tenderness about the precordia. Examine also the beating of the carotids and the temporal arteries."—*Dr. Sutherland.*

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*Illustrations and Sketches of Medical Quackery.*—Walpole says that acute and sensible people are often the most easily deceived by quacks. A deceit, of which it may be said—"It is impossible for any one to dare it," always succeeds.

If the imposture required any ingenuity to detect it, there might be some hope for mankind; but it actually lies concealed in its *very obviousness*. At the same time it must be owned, that, in some cases, no little degree of firmness is required to resist the importunity with which a nostrum is recommended. "I seriously declare," says Sir A. B. Faulkner,\* "that I was myself pressed with no little earnestness, by a person not otherwise above par in credulity, trying to persuade me of the infallible powers—of what?—Ye shades of Hippocrates and Æsculapius—what?—actually and seriously, a decoction of flint stones!!! The prescription was grave and methodical. The flints were to be boiled, and the supernatant liquor poured off for use. The lady who advised this precious physic, would do so on the best authority; and not of one, but of many persons of her acquaintance, upon whose word she could place the most implicit reliance."

The charm is in the *mystery*, in all these cases. "*Minus credunt quæ ad suam salutem pertinent, si intelligunt,*" says Pliny. Credulity is indigenous in no particular climate. "In Chili," says Zimmerman, "the physicians

\* Visit to Paris.

blow around the beds of their patients, to drive away disease; and, as the people in that country believe that physic consists wholly in their wind, their doctors would take it very ill of any person who should attempt to make the method of cure more difficult." They think they know enough when they know how to blow; which, translated into common language, means, "raising the wind."

Lord Bacon says, "That the impostor frequently triumphs at the bed-side of the sick, when true merit is affronted and dishonored; the people have always considered a quack, or an old woman, as the rivals of true physicians. Hence it is that every physician, who has not greatness of soul enough not to forget himself, feels no difficulty in saying with Solomon, '*if it is with me as with the madman, why should I wish to appear wiser than he is?*'"

"The world is generally averae  
To all the truths it sees and hears;  
But swallows nonsense and a lie,  
With greediness and gluttony."

BUTLER.

*Physic and Physicians.—Med. News.*

*Climate and Characteristics of Nice.*—Nice, a city with nearly thirty-four thousand inhabitants, is situated on the Mediterranean, just within the confines of Italy, on a promontory, proceeding from a range of the maritime Alps, in lat.  $43^{\circ} 41'$  N., and long.  $7^{\circ} 16'$  E. Its climate is supposed to be the mildest on the north coast of the Mediterranean, owing to the gradually rising lines of hills which shelter it from the N. E. round to the W., leaving it open to winds only on the S. and S. E. From observations, continued from 1806 to 1838, the mean height of the barometer has been found to be 27.11, the range being only between 26.11 and 28.8. Out of 36,135 observations of the thermometer, it was only once seen to rise so high as  $92^{\circ} 5'$  Fah., the lowest point having been  $15^{\circ}$  Fah. The maximum of the hygrometer was  $100^{\circ}$ , the minimum  $17^{\circ}$ , the mean  $59^{\circ}$ . The *tramontane* north wind seldom descends into the lower plain of Nice, but sweeps directly from the mountains down to the sea; the east wind is dry and cutting, the south relaxing, the S. S. W. wind, or *lebec*, is very prejudicial to health. Dew is abundant, but mists are extremely rare. The soil of the environs is an aggregate of chalk, clay, and sand, and of much fertility. The inhabitants are generally of low stature, with a muscular but not fleshy frame, and a pale complexion generally. It is remarked, that where oil is much used for food, the complexion is pale, while a diet of milk is attended by a rosy and fresh color.

The lower class of females at Nice become marriageable at from twelve to thirteen years of age, and mothers of thirteen years are not uncommon. Young ladies marry at from fifteen to twenty, young men at from eighteen

to twenty-four. Child-bearing is said to cease at from forty-three to forty-five years of age. The average length of life is thirty-one years.

The most prevalent diseases are those of an inflammatory kind—pneumonia, pleurisy, catarrh, &c., occasioned by sudden alternations of temperature, variable winds, and an atmosphere often charged with irritating matter. Pulmonary complaints have latterly been more numerous among the population (probably owing to Nice having become more than formerly a place of resort for consumptive patients.) In the town and immediate district of Nice, from 1828 to 1837 inclusive, there were born 10,968 persons; the deaths in the same period amounted to 9,163. In the south of the province of Nice, many mothers are found with eighteen and twenty children; twelve are a frequent occurrence, and from six to eight are quite common; but the average number of children to a marriage is estimated at from four to five. The number of marriages in the province annually is computed at from ten to twelve in every one thousand of the inhabitants.—*Sir J. P. Boileau, in Statist. Jour. for August, 1843.—London Lancet.*

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*Theory of Animal Heat.*—By J. M. WINN, M. D., Truro, England.—About three years since, whilst making a few experiments with caoutchouc, I was forcibly struck with the property it possesses of evolving heat when suddenly stretched, and was led, at the time, to infer the probability of other bodies being similarly endowed. The elastic coat of arteries, especially, from the mechanical resemblance it bears to caoutchouc, appeared to be one of the substances most likely to exhibit this calefactory principle; and in the event of this being the case, it would not be unreasonable to conclude that the incessant contractions and dilatations of the arteries during life, must form an efficient source of animal heat.

During the past week I was induced to resume the subject afresh; and upon making an experiment with part of the aorta of a bullock, I felt much gratification in being able to verify my previous conjecture. The experiment was performed in the following manner:—Having cut off a circular portion of the descending arch of the aorta, about an inch in length, I laid it open and carefully dissected out the elastic coat, and taking hold of it by each extremity, I pulled it to and fro, with a continuous jerking motion, (in imitation of the systole and diastole of the artery,) for the space of about a minute, when placing it on the bulb of a thermometer, I had the satisfaction to find that after it had remained two minutes the mercury had risen as many degrees. On removing the thermometer, the heat immediately began to diminish. To be certain that the heat did not arise from any other source than the one in question, I took the precaution of covering my fingers with a double layer of flannel, to prevent the communication of heat from the body; I also covered my mouth with a handkerchief, to guard against the warm breath affecting the thermometer, whilst watching the progress of the experiment. I may likewise state that the experiment was performed in a room

without a fire, the temperature of the air at the time being 55°. There were several difficulties to contend with during the investigation, and it was not until after repeated trials that the experiment succeeded to my satisfaction. The chief impediment, I think, must have been owing to the moisture of the artery, which, by its evaporation, must have had a constant tendency to carry off the heat. Having, however, performed the experiment twice consecutively, in the same satisfactory manner, I think there can be but little doubt entertained as to its conclusiveness. My attention was often arrested, whilst conducting the experiments, by the striking mechanical analogies between caoutchouc and the elastic coat of the arteries. Like the former, the latter could be elongated to twice its ordinary length, and on withdrawing the tension would return to its usual dimensions, with considerable force and a snapping noise. I was also surprised to find, on slightly drying it, that it would erase black-lead pencil marks from paper, without leaving a stain. This latter circumstance is perhaps of trifling importance; it serves, however, to show that strong mechanical resemblance may exist between bodies widely differing in their chemical properties.—*Philos. Mag.—Bot. Med. & Sur. Jour.*

*Swallowing a five-franc piece—Its extraction from the œsophagus.*—At the end of 1838, a farmer in France consulted a medical practitioner for the consequences of his folly in swallowing for a wager, a five-franc piece, a coin about the size of an English crown. (We had thought that such absurd bets were confined to John Bull, but the French journals have lately recorded several instances showing that our neighbors are not disposed to be far behind us.) The man in question had suffered for the space of eight days from the presence of the coin in the œsophagus; he could swallow only milk, broth, and other liquids, and was on the high road to perish of hunger.\* Pale and half dead with fright, he now applied to M. Monin, who reports the case. That gentleman, on passing an India-rubber sound into the œsophagus, ascertained that the coin was impacted there at about the junction of the upper two-thirds with the lower third of the tube; and he suspected, from being unable to pass his instrument beyond it, and from other signs, that the body was placed horizontally, so as nearly, if not wholly, to block up the passage. The membrane of the œsophagus was so closely contracted around the coin, that the elastic sounds of caoutchouc, whalebone, &c., at first used, had not force enough to compel the latter body to assume a more favorable position. In these embarrassing circumstances M. Monin caused some forceps to be made, the limbs of which were curved so to form the segment of a circle, and which opened sideways in the direction of the mouth, and *not vertically*,—a point strongly

\* And of fatigue also, if dancing can fatigue a Frenchman. "For a practitioner to whom he had first applied recommended him to live on oil, and to *take to jumping*, to facilitate its entrance into the stomach, and for eight days he had religiously jumped as high as he could."

insisted on by M. Monin. The inside of each limb, at its extremity, was roughened with a file. This instrument, well oiled, was introduced with ease into the œsophagus of the patient, the left forefinger of the operator being placed over the root of the tongue and epiglottis. With a small degree of force, the instrument now obliged the coin to place itself in a vertical position, or with its rim upwards, and in a few moments it was seized by the forceps, and being firmly grasped, slow and gentle traction was employed. This was continued till the coin arrived in the pharynx, where, being arrested by the arch of the palate, it suddenly escaped from the hold of the operator. The pressure it now exercised over the glottis caused symptoms of imminent suffocation; but a sharp blow between the shoulders speedily caused the expulsion of the coin from the mouth.

The operator, who has a humorous way of reporting the case, says, "to make a bound, and dash after the object which had caused him so much terror and suffering, was the first impulse of the poor patient, who disappeared like a flash of lightning, (*partit comme une éclair*.) without paying the least attention to my recommendation of moderation in diet after his long starvation. I did not see him for several days afterwards, when he complained of nothing but a little soreness at the point where the piece of money had been impacted. He experienced no other ill effects from his imprudence.—*London Lancet*.

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*Secret Remedies in France.*—The sale of secret remedies is prohibited in France, unless legally protected by patent, which is never granted without a report from the Royal Academy of Medicine, certifying the harmlessness of the remedy. This is not the only hinderance to the sale of those compounds. Our London warning, "Bill-stickers, beware!" is uttered with more authority by the French law; and it would appear that the Parisian quack is destroyed, like a parasitic plant, by removing him from the wall. This fact is thus exemplified: "A practitioner caused a placard to be affixed on the shop of a grocer in the Rue St. Denis, advertising a remedy against secret complaints. The grocer brought an action against the doctor, who was condemned in 2*l.* damages. The court cautioned Dr. M. not to affix placards on the walls lest he should incur renewed actions for damages."

If it were made illegal to post the walls thus, or to advertise them in the newspapers, quack medicines could not exist. Few empirical preparations could stand the silent system. Again, M. Boubee is a regularly educated *pharmacien*, rivalling M. Beral in the preparation of citrate of iron, and established at Auch. He contrived a syrup to banish gout from France, affixed his name to it, and in time sold it in several shops at Paris. But M. Boubee forgot to register the exact composition of his sedative solution. This at once turned the syrup into a secret remedy; and he was cited before "Le Tribunal" to answer for the advertisement and sale of secret remedies. Not appearing, he was recently condemned to ten months' imprisonment, and a fine of 24*l.*—*Ann. of Chem.—Med. News*.



## FRENCH MEDICAL SOCIETIES.

*Academy of Medicine.*—July 4th. (M. Dubois, president)—M. Colombat, of Isere, read a memoir giving an exposition of his system for the cure of stammering. According to him, stammering is purely a nervous affection, a functional disease, and is of two kinds, *choreic* and *tetanic*. Choreic stammering consists in a kind of chorea of the lips, and a succession of convulsive movements, more or less rapid, of the tongue, lower jaw, and all the muscles of articulation. The stammering called by M. Colombat, tetanic, is marked, as he says, by a kind of tetanic rigidity (*raideur*,) or a tonic spasm of all the respiratory muscles, but eminently those of the larynx, pharynx, and base of the tongue. This kind of stammering is most perceptible in the guttural letters, to articulate which is always a painful effort, signalised by an explosive and hurried sound (*expiration anticipée*) and then an interval of silence before the finishing of a word; by immobility of the tongue, closure of the glottis, a sense of pressure within the chest, and a momentary impression of suffocation. Individuals of the more active temperament and nervous excitability generally suffer from choreic stammering; these speak rapidly and commonly without effort, but with the repetition of certain letters—b-b-b—f-f-f, &c. On the other hand, in the *guttro tetanic* species of stammering, persons speak slowly, and evidently with effort. Both these kinds, however, often affect an individual at the same time. We need not enter into M. Colombat's numerous subdivisions of the two kinds of stammering.

Among the curative means proposed by the author are the following:—Patients with the choreic kind are advised to employ the zygomatic muscles pretty constantly, and while speaking, to open the commissures of the lips, as in smiling. With the lips brought into the resulting position, labial stammering is next to impossible, and the tongue also, carried backwards, facilitates the pronunciation of other than the labial letters. For the tetanic kind, another exercise is proposed, bringing into play at once all the muscles concerned in the production of speech. It consists in drawing an inspiration, at the same time forcing backwards the tongue, so that its point should approach the velum palati, while the lips are extended as above detailed for the choreic kind. At other times, in lieu of stretching the lips transversely, the mouth is extended vertically and the jaws separated as widely as practicable for the pronunciation of syllables. At this time, also, the tongue is to be retracted in the mouth to a distance of two or three lines behind the teeth. The hurried nature of the respiratory acts in stammering of this kind, consequent on spasm of the chordæ vocales, &c., is thus brought under control. By throwing back the tongue into the pharynx, in the manner indicated, the opening of the glottis is widened at the same time that the chest is filled and emptied of air. Several accessory means are employed by M. Colombat with a similar view. He directs the attention of his patients eminently to the *rhythm* of the sentences they employ, which tends to withdraw their minds in a salutary manner from noticing their physical defects; he incul-

cates the use of certain syllabic exercises, and for choreic stammerers especially he has invented an instrument which he calls the *muthonome*. This instrument acts somewhat like Mæzel's metronome, but is constructed on another principle, and will go for several days without being wound up. By its means, M. Colombat limits the syllables to which his patients give utterance at first to 60 or 80 in a minute, which number he gradually increases to 160 or 180 in the same space of time. The foregoing are among the methods by which M. Colombat has, as he says, in a period of fifteen years, restored the free exercise of speech to 782 persons, of whom 643 were cured without relapse. In general, from a month to six weeks perseverance in his treatment has been sufficient to obtain a cure, though it may sometimes have to be prolonged for about three months. In the ACADEMY OF SCIENCES, at the sitting of July 3rd, a memoir on the same subject, by M. Jourdan, was read, in which it was advanced that stammering was for the most part a consequence of too rapid expiration, obliging the patient to respire several times to enable him to conclude a sentence. The suggested treatment was, accordingly, as follows:—The patient is to perform a natural inspiration, the course of which is to be suddenly arrested. A sentence is then to be begun, slowly pronounced, and continued till it, or a fixed portion of it, is finished. Then the air remaining in the chest is suffered to escape altogether, and, after a short pause, the same process is to be recommenced. The tongue is to be maintained in an easy and natural position, "which is that in which it lies, for instance, after having swallowed the saliva." The medium time occupied in cure, according to this method, is reported to be a month, the patient practising the method recommended for two hours daily.

At the sitting of July 10th, M. Boussingault made a favorable report of a method proposed by M. Sirey for the removal of fæcal stench. The agents used for this purpose by M. Sirey are powdered charcoal and sulphate of iron.

M. Valenciennes read a paper on verminous tumors found in the stomach of the horse, the worms inhabiting which tumors, are altogether different from those found in the large intestine. Out of twenty-five horses, the stomachs of which he examined after death, either alone or in conjunction with M. Rayer, he had found these entozoa in eleven, in one of which were two verminous tumors, and in another four. They were situated between the mucous and fibrous coats of the organ, with the cavity of which they communicate by from one to five openings, and through these the worms easily pass. The tumor is internally subdivided into cells by folds of membrane secreting a mucus, which sometimes concretes in such a manner as to give the tumor almost a scirrhus hardness. The worms lodged in these cavities are supposed to be the *spiroptera megastoma* of Gurlt; but M. Valenciennes considers that they ought to be classed between the *spiroptera* and the *ascarides*. The males are nearly half an inch in length, by about 1-50th of an inch in thickness; the females are somewhat larger and stronger, varying in length from half an inch to an inch and a third, and nearly a millimetre, (1-26th of an inch) in breadth.—*London Lancet*.

*Results of Homœopathy.*—We regret to state that another of the Earl of Denbigh's family has fallen a victim to the theory of infinitesimal doses. His lordship's third son died, last week, from accumulation of mucus in the air passages, the result of whooping cough. An emetic is usually employed, in cases of this kind, to free the bronchia; but whether the homœopathic fractions of ipecacuanha produced this effect or not, we have not heard.

*Prov. Med. Jour.—Western Lancet.*

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How to make Leeches bite.—The leech, which it is intended to apply, is to be thrown into a saucer containing fresh beer, and is to be left there till it begins to be quite lively. When it has moved about in the vessel for a few moments, it is to be quickly taken out and applied. This method will rarely disappoint expectation, and even dull leeches, and those which have been used not long before, will do their duty. It will be seen with astonishment how quickly they bite.—*Med. Ex.—from Weitenweber's Beitr., and Schmidt's Jahrb.—Western Lancet.*

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*Operation for Cataract.*—In a communication, signed "A Subscriber," we are informed that "Dr. Thos. H. Roe, of Newark, has lately performed this beautiful and skilful operation on James Green, of Muskingum county, a young man 28 years of age, who had been stone-blind from his birth." No unfavorable symptoms, we are informed, occurred, and the operation was successful. The patient had some difficulty in exercising his new sense, so as to judge correctly of distance and forms, and colors; though he acquired a knowledge of the latter sooner than of the former.—*Western Lancet.*

## Bibliographical Notices.

*Observations on the extraction of the Teeth, with plates.* By J. CHITTY CLENDON, Surgeon Dentist. LONDON; S. HIGHLEY, 12 mo, pp. 80, 1843.

WE announced, in the June number of the third volume of the Journal, the publication of the above named work, but as we had not then seen it, we were unable to speak of its merits. We have since received and read it, and should have presented our readers with a brief expose of the author's views and the manner in which he has treated his subject, in the first number of the present volume, had we not been prevented by want of room. But although delayed until now, in performing this task, an outline of the plan of the treatise, may not, nevertheless, even at this time, be uninteresting to the profession in this country. We shall, therefore, proceed to notice such parts of it as we may deem most worthy of consideration.

The work is very well written and neatly gotten up, and the object which the author had in view in writing it, was to supply what he conceived to be a want in the literature of dental surgery. To what extent he has done this, we shall endeavor to show. That many parts of his design have been well executed, all who have read his book, will acknowledge, but he has not carried out all as fully and satisfactorily as could have been wished.

The author, in the introduction, after asserting the necessity for the extraction of such decayed and aching teeth as cannot be relieved and restored to health, very properly denounces that class of empirical practitioners who condemn the operation, and endeavor to persuade their patients that it is unnecessary, merely for the purpose of inducing them to submit to some other treatment which they may prescribe, that shall realize to themselves greater pecuniary gain. As a proof that teeth, which have become obnoxious to the living parts that surround them, should be extracted, he adduces the well known fact that the efforts of nature are, in various ways, exerted to expel them. After describing the means employed by the economy for the removal of such teeth, which consist in the filling up and destruction of their sockets, he enumerates the "pain and irritation," to which the patient, in the mean time, is subjected, and the injury that is liable to result to the contiguous parts, as reasons why the operation should at once be performed.

But while he urges the necessity of the extraction of such teeth as cannot be permitted to remain in the mouth with impunity, he is not in favor of removing any that can be made healthy and sound by filing or plugging. He at the same time contends, and in the majority of cases, he is unquestionably correct, "that when a tooth has become the seat of severe pain, the favorable period for filling the cavity has passed, and the chances of saving it very remote." There is so much truth and sound sense in this remark, we wish its practical bearing and importance, were more generally felt and acknowledged than they seem generally to be by the members of the dental profession. Teeth are filled, every day, that cannot by any surgical operation be so restored as not to be productive of irritation to the parts with which they are in contact, and which, by being thus tampered with, are rendered more offensive to them than they would otherwise have been.

The necessity for the extraction of teeth being established, the author thinks the "assumed cruelty" of the operation "disposed of, although" it may "attach to the manner in which it is too frequently performed," and in this opinion we fully coincide. Few persons, even among those who are in the daily habit of extracting teeth, perform the operation with as much dexterity and skill as they might do, were they provided with suitable instruments and properly instructed in their use.

The views of the author as expressed in the introduction, are based upon sound physiological principles, and discover him to be a man of judgment and experience.

The work is divided into three parts—the first treats on the "key instru-

ment" and its employment for the extraction of teeth—the second on the use of forceps—and the third on the advantages of these last named instruments, to which the author gives a decided preference. After noticing the principle on which the former acts, he states that, to the application of this, "and to the use of the instrument altogether, from certain circumstances," which he does not here relate, he "early entertained a strong repugnance, a feeling which time and experience" had "increased rather than diminished." Even when placed in experienced and careful hands, he says, "the instrument is often *difficult of application, unscientific and uncertain* in its operation, and always productive of *additional pain and subsequent inconvenience.*" He next proceeds to notice the difficulty of applying the instrument. The size of the claw, he says, must be determined by that of the tooth to which it is to be applied, which should "act in a line as nearly parallel" to the fulcrum "as the principle of a lever will admit." But we do not deem it necessary to notice the various things which he enumerates and describes as being necessary to be considered in the employment of this instrument. We will, however, quote what he says concerning the error under which very many practitioners labor with regard to the agency the claw exerts in raising a tooth from its socket.

He remarks, "to lift a tooth without doing violence to the socket in which it is placed, the necessary extractive force must be applied either in a *perpendicular* or in an *oblique* direction; the want of sufficient space and risk of injury to the antagonist teeth will generally prevent the former, and to accomplish the latter, the sweep taken must be in proportion to the length of the roots and their position in the socket. Now the edge of the claw in turning, describes the segment of a circle whose diameter is far too small to admit of the tooth being raised obliquely; the moment pressure is applied to the handle, the fulcrum turns abruptly on its bearing, and drags the claw in a parallel direction, the effect of which is to cant or upset the tooth—the claw itself preventing the former from rising over the edge of the socket."

Here the author, in a note, alludes to the directions given by Mr. Bell for the use of the key, "who," he says, "evidently feels the force of this conclusion, as he recommends a *perpendicular movement* to be given to the instrument, to facilitate the extraction of the tooth, forgetting for the moment that the success of the operation must chiefly depend on keeping the fulcrum steadily in its place; that directly it is raised, it ceases to act as a lever, and becomes in fact, only an imperfect pair of forceps."

But proceeding with the subject, he says, "by removing the tooth in this lateral direction, the natural obstructions are very much increased, and from causes, which" he thus explains:

"If we suppose the crown strong enough to sustain a force adequate to remove the tooth, the claw in the first instance will press it against that part of the alveolus on which the fulcrum rests, while the latter, by its own pressure, in a great measure counteracts the effect produced by the claw, as it not only forces the alveolus against the roots, but prevents the former from yielding, so as to afford a passage for the escape of the tooth; at the same time the extremities of the root press on the opposite side of the alveolus, which offers an effectual resistance, and it is only when the fulcrum has

turned sufficiently to allow the socket to break away, that the tooth can possibly be removed. When the latter is very firmly fixed, and the crown proves unequal to bear this lateral pressure, it will assuredly break off at the neck—a consequence the more likely to ensue, as the claw, however low it may be thrust, has a tendency, from the motion of the instrument to rise until it catches the ridge formed by the terminal line of the enamel."

Mr. Clendon proves the correctness of the foregoing explanation, by showing the "effect of the claw on a stout nail driven into a piece of close grained wood—bearing some resemblance to the form of the jaw—to an extent equal to the depth of the roots in their sockets, and requiring the same degree of force to withdraw it as to extract a tooth. The fulcrum must be made to bear on the wood, and the claw to grasp the nail by a groove previously cut for that purpose. If the handle of the instrument be now turned, the claw will immediately press on the nail, and bend it to a curve corresponding with its own direction, and then, if the hold continue sufficient, it will be withdrawn. If the nail were of cast iron, or any brittle, unyielding substance, instead of bending, it would break just below the surface of the wood, immediately adequate force was used; but should it prove equal to withstand this force, the wood must then give way, or the instrument be broken."

The reasoning of the author is philosophical, and with us, had we never had any experience in the use of the key instrument, it would be conclusive. We, however, used this instrument nearly altogether, for the extraction of teeth, for many years; and although it was exceedingly seldom that we failed to perform the operation with ease and at once with it, we do not hesitate to affirm that any tooth that can be extracted with the key, can also be removed with properly constructed forceps, and that too, in the majority of instances, with greater ease to the operator, and less pain to the patient. We know that in the expression of this opinion, we differ from many of our professional brethren; and that there are many skilful and experienced practitioners who, while they prefer the forceps for the extraction of most teeth, nevertheless occasionally employ the key. We are confident that these same practitioners, if they would provide themselves with properly constructed forceps, for the extraction of those teeth which they prefer to remove with the key, and would use them for six months, to the exclusion of that instrument, they would never go back to its use again. We could mention the names of more than thirty, who, at our instance, have done this, and the result has been that all have entirely abandoned its use; and we believe the day is not distant when it will not be found among the instruments of any dentist in the land. We have not had one in our possession for nine years, and in a conversation which we, a few days since, had with an extensive manufacturer of dental and surgical instruments, he informed us that he sold fifty sets of teeth forceps to where he disposed of one key. That instrument, it is certain, is rapidly going into disuse among American dentists.

In discussing the subject of the use of this instrument, Mr. C. notices, in succession, and at some length, the "uncertain effects of the claw," the "pain produced by the pressure of the fulcrum," the "obstructions caused by the irregular form of the roots," and then concludes this part of his treatise with some general remarks.

In the second part of the work, which treats on the form, application and extraction of teeth with forceps, the author intimates that those who condemn the use of them, and have returned back to the key, have made trial of such as were as illy calculated for the purpose as "common pliers or carpenter's pincers." The defects in the form and construction of forceps have hitherto, we are convinced, prevented them from coming into general use; not one pair in five hundred are of the proper form and construction, and in view of this fact, it is a matter of wonder to us, that as many use them as do. They should not only be so constructed as to fit the necks of the several classes of teeth, but should be so bent as not to interfere with the other teeth, and to enable the operator while occupying such a position by the side of his patient, as to enable him to control his head and support the jaw, and at the same time to have such a grasp upon the instrument as to be able to exercise with convenience a perfect control over the power which it may be necessary to apply to it for the removal of the tooth. The author says, and very correctly too, that "the entire length of the instrument should not exceed six inches, with the exception of those used for the wisdom teeth," which require to be a little longer. He also recommends them to be substantially made, so as to prevent them from springing in the hand, as otherwise the moving of the instrument might be mistaken for "the yielding of the tooth." These are points which should, on no account, be overlooked in the procurement of forceps, and we have urged their importance on several occasions.

Mr. Clendon divides the teeth, with reference to their extraction, into eight classes, each of which requiring a pair of forceps specially adapted to the teeth that belong to it. They are, in the upper jaw, 1. The lateral incisors and bicuspidates. 2. The central incisors and cuspidati. 3. The first and second molares of the right side. 4. The same of the left side. 5. In the lower jaw, the incisors and canini. 6. The bicuspidates. 7. First and second molares, right and left sides. 8. The dentes sapientiæ of the upper and lower jaws.

The beaks or chops of the forceps employed by the author for the removal of the teeth of each of the foregoing classes, differ so little from those recommended and described in our treatise on dental surgery, that we do not deem a description of them necessary. They are such, except that neither of their handles are curved, as have been manufactured by Mr. Samuel Jackson and Messrs. Daily & Arnold of Baltimore, for the last nine or ten years.

Besides these eight pair of forceps, he says, two more are necessary for the extraction of "roots of teeth,"—one for those of the upper, and one for those of the lower jaw. He recommends that the first have "both blades [beaks] and handles slightly curved, that roots of teeth situated in the back part of the mouth may be easily reached, and that the second have the blades [beaks] bent at right angles with the handles." The beaks or blades of forceps employed for the extraction of roots of teeth, should be much longer than those used for the removal of teeth that are grasped at their neck, and they should also, as is remarked by our author, be very thin; but we cannot agree with him

that the pair for the extraction of roots in the lower jaw should have their beaks bent at right angles. They can be by far more easily applied when bent only at an angle of about forty-five degrees with the handles. This is a point to which we have paid particular attention, having made thorough trial of both descriptions of instruments, we are enabled to speak advisedly upon the subject.

The hawk's bill forceps the author regards as decidedly objectionable, acting as the instrument does, very much upon the principle of the key, the lower blade or beak performing the office of the fulcrum, whilst the upper serves as a claw. It is also objectionable for another reason, and that is, the operator, while extracting a tooth on the left side, requires the assistance of a third person to hold the head of his patient. And while upon this subject, we would remark that the operator would have much greater control over the lower molar forceps recommended by Mr. C. if their handles were curved laterally towards him, so as to form an angle of about forty-five degrees.

With regard to the manner of extracting teeth with forceps, ample directions are given, but these are points upon which we do not deem it essential, in a notice of this sort, to dwell.

The author sets forth, in the third and last part of the work, the "advantages of forceps," but as we think their superiority will be inferred and admitted from what has already been said, we do not think it necessary to notice the arguments which he advances to establish that fact, suffice it to say, they are clear and conclusive.—*Balt. Ed.*

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## Miscellaneous Notices.

*Our Work.*—The Boston Medical and Surgical Journal, of October 25th, has the following remarks:

"AMERICAN JOURNAL AND LIBRARY OF DENTAL SCIENCE.—This discreetly conducted periodical, seems to be not only well sustained, but highly prized by the profession.

"To operating dentists, the Journal must be of the very highest value, as it furnishes them with every known improvement in the art from all respectable sources. Our interest in the success of the American Society of Dental Surgeons, and their writings, is unabated."

For these kind expressions, on the part of the editor of the Boston Medical and Surgical Journal, whose approbation is the more gratifying because never bestowed in insincerity, and rarely in profusion, we feel a becoming gratitude. The approbation of the best Medical Journal in New England, frequently and warmly reiterated, shall be improved as an encouragement to continue our exertions in the cause of dental science.

Nor shall we relax our efforts because a few individuals in our profession,



regret the establishment of the Society and its Journal, on the ground that it gives publicity to the secrets of the art, and therefore greatly augments the numbers of its professors.

True, the Society and the Journal are alike calculated to communicate to *many*, the useful knowledge which was formerly confined to but *few*. But what is the consequence? Plainly this:—that the profession at large, as well as the public, are greatly benefited; although a few individuals may be prevented from enjoying a monopoly to the permanent detriment of the majority of mankind.

And what will be the necessary consequence of this diffusion of knowledge in the dental art, and of this augmentation of dental practitioners? Will it not be the elevation of the profession, from isolated quackery to organized and co-operative science; and will not the army of ambitious adventurers who have recently assumed the functions of our art, furnish many noble imitators of Greenwood, Hudson, Cartwright, Parmly, Nasmyth and Brewster, who have contributed the zeal, the perseverance, and the activity of genius, to the welfare of mankind.

If, at this moment of time, there shall be found to be an excessive influx of young artists into our ranks, competing vigorously for the public patronage and favor, both the public and the profession will realize immense advantage from this competition, in years to come. The knowledge of the art of dental practice, and of the science of operative dental surgery, will be every where so widely diffused, that the humblest citizen of our republic will be able to distinguish between the catch-penny quack and the genuine artist, who deserves, as he will receive, the blessings of his fellow men.

This happy result of wide spread knowledge in our art, is already beginning to be realized in the southern section of the United States, where the difference between a good dental operator and a charlatan is very quickly detected. The same is true in certain sections of the northern and western states, but not to the same extent as at the south, because these latter regions have not been so long and so thoroughly canvassed by all sorts of dental operators; nor, perhaps, is the necessity of dental services so frequent in the higher as in the lower latitudes.

Scarcely a day passes in which we do not obtain new evidences of the increased confidence which the public reposes in good dental operations, and also in the decisions of the American Society of Dental Surgeons, on the subject of those individuals deemed worthy of its fraternity. There are some, peradventure, among its members, as in all other associations, who little deserve the distinction which membership in this society is calculated to bestow; but the great majority of the associates are found not only to deserve but to command the confidence of the public.

As something like twenty or thirty new members are created at each successive annual meeting of the Society, it will soon assume a formidable aspect, and operate with incalculable power in suppressing quackery and extending the benefits of honorable and useful dental practice to all orders of society.

Inasmuch as the American Journal of Dental Science is the organ of the Society, in the propagation of the true principles of the science of dental surgery, we call upon our brethren, in all parts of the country, to contribute sedulously to its pages all such articles as may convey useful instruction to any of its numerous readers.

The successive volumes of this work convey to posterity a history of our art in the middle of the nineteenth century, and with it the names and memory of those who nobly sacrifice, upon the altar of the public good, the private advantages of isolated selfishness. There can be little doubt, that some of the distinguished individuals who have aided in forming the national Society, and in establishing the Dental Journal as a vehicle of practical information, have thus waived the privilege of employing the knowledge of their art, which they had gained by extensive travel, by long experience, and unremitting efforts for personal aggrandizement. In this they have not, indeed, experienced the peculiar emotions of a dentist residing in one of our large cities, who recently inquired of a member of the American Dental Society, "*whether admission to membership would put any money into his pocket ;*" and added, that "*if it would, he should be inclined to become a member.*" Noble and exalted sentiment! worthy of those numerous *Dii minorum gentium*, by whose presence the profession of dental surgery has become so justly distinguished.

But as we have already intimated, the time is rapidly approaching when public opinion will correct the existing evil of an excess of practitioners in our art. That there will always be a few quacks to act as a foil to set off, by contrast, the beauties of genuine art, there is no reasonable doubt. But the majority of those individuals who have rushed into dental practice, unprepared and uncalled, during the recent stagnation in most of the common branches of industry, will soon find that their golden dreams of wealth and greatness, are not likely to be realized in dental practice, and they will therefore prudently betake themselves to various callings for which they are better qualified both by nature and education.

The experience of the past ten years has shown, that, among the hundreds and thousands who have gathered themselves together to what they regarded as the golden harvest of dentistry, ripe and ready for the sickle; only a very small number, perhaps five in a hundred, will ever be able to attain to either eminence or usefulness in operations on the teeth. These operations require a rare and peculiar assemblage of talents, possessed only by a few. As well may every stripling who can raise a pair of curled mustachios, or bushy whiskers, expect to become an accomplished vocal musician, without either ear or voice, as a successful dental surgeon without the necessary talent and the proper education.

We say, therefore, that the time has come when we begin to perceive a manifest reaction on the subject of rushing unprepared into dental practice; and in five more years, if the American Society of Dental Surgeons, and their Journal, continue as they have done, to correct the public sentiment,

the only road to success in this department of industry and talent, will be a thorough education, and a patient apprenticeship with the eminent practitioners of the art.

B.

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### THE WAY SOME PERSONS BECOME DENTISTS.

"A man must serve his time to every trade  
Save censure, critics are already made."

This may have been true once, but the poet evidently was no prophet: he did not foresee the day when men should make themselves dentists by a simple act of volition, as the celebrated Jew physician, who gained great reputation in London, made himself a doctor. He was out of money, out of employment, out of patience, and out at the elbows,—suddenly he exclaimed, "I am a doctor;" his education was completed, and in a little while he was in full practice. How many dentists have as suddenly willed themselves into business, by this short-hand method of professional induction, we cannot tell.

Fire in each eye, and forceps in each hand,  
They swarm, and cheat, and swagger round the land.

Give one of these gentry a pot of mineral amalgam, and a few leaves of tinfoil, and it will be strange if he does not pick the pockets of a neighborhood. Yet, after all, this must be a bad business: people soon discover that they are cheated; practice falls off, as fast as it came on, and the great dentist, who makes bad teeth to be better than good ones, and fills cavities with indestructible (Cornwall) silver or self-adapting paste, is obliged to leave the scene of his miraculous performances, with more despatch than dignity. This routine of operations is performed again and again, until there remains no place where the man is not known, and no place to which he can go; those that know him best, and are most anxious to see him, are precisely the people whom he desires with all his heart never to meet again.

But there is another class of dentists, who must by no means be confounded with the vagabond order above mentioned, and yet who are very unfit to practice the surgery of the mouth. These are well meaning people, who, either from ignorance of what is necessary to fit them for the profession, or from inability to procure proper instruction, commence practice with scarcely the elementary knowledge of the dental art. They can file a tooth, and perchance extract one. They can paste up a cavity, or fill a hollow grinder with tin or even with gold, but not in such a manner as to secure its preservation. They may even have a sufficient idea of the business to insert, in a bungling way, a pivot tooth. But beyond these rude mechanical efforts, they know nothing, until they acquire experience by practice,—that is to say, until they have committed every sort of blunder so often, and with such painful consequences, as to make it hard for them to err in the same way

again. Of this kind of dentists there are great numbers, and greater numbers still are daily joining their ranks.

But there is another class of dental surgeons, very different from those above mentioned. These are the men of science; the men who understand the great principles of medical treatment, who know that the mouth is an integral and most important part of an exquisitely organized whole, and who apply the science of surgery to this one part, not as being detached from the body, but as most closely connected with it. Few of the most skilful surgeons in the country could perform, with excellence, an ordinary dental operation; few could properly pronounce, at a glance, upon the nature and extent of the diseases of the teeth: how then can an uneducated man expect to do this? If the profoundest knowledge of surgery, and constant practice in it, does not make a man a dentist; if even the most skilful surgeon must study the diseases of the mouth and their treatment as a speciality, what strange presumption is it in an uneducated man to undertake the practice of an art, so important and so difficult.

It must be repeated until it obtains the currency of a proverb, that dentistry is a department of surgery, and that the man who would practise it properly must prepare himself by diligent study and careful mechanical operations.—*Balt. Ed.*

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*Cutlery.*—Some eighteen months or two years ago we took occasion to notice the high state of perfection, American cutlers had brought the manufacture of surgical and dental instruments, and to contrast those manufactured in this country with those obtained from Europe. We are fully convinced that nothing is now to be gained by sending to England for either dental or surgical instruments. That the European manufacturers greatly excel the American in many articles of cutlery, we do not doubt, but the reason of this we believe to be principally owing to the indisposition on the part of the people of this country to patronize home manufacturers. As for example, not one in a hundred can be found to believe that a pen-knife is worth having, that has not the name of Rogers upon its blades. Until very recently, we were among the number that entertained this opinion, but a few weeks since having occasion to procure a pocket knife, and after having visited several establishments where such articles are usually kept for sale, without being able to please ourself, we at last stepped into the store of Mr. Samuel Jackson, manufacturer of dental and surgical instruments, Baltimore, where we supplied ourself with, not only one of the most beautiful, but with the very best knife we ever had. It has four blades, and for keenness, delicacy and durability of edge they surpass any of Rogers' we have ever used.—*Balt. Ed.*

would be deposited upon all the teeth alike. The fact stated by him, that infusoria may be seen, in mucous matter, found around and between the teeth, when diluted with distilled water, proves nothing at all, for it is well known that the tartar of the teeth is always more or less mixed with the mucous secretions of the mouth, and if the infusoria have their origin in this fluid, their presence here, may be thus accounted for.—*Balt. Ed.*

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Eleazar Gidney, Esq., Surgeon Dentist.—Who, for a number of years, has resided in Manchester, England, where he has enjoyed an extensive and lucrative practice, returned, from a short visit which he made to this country, on board the Great Western, the latter part of October last. The confidence which American dentists command abroad, and even in England and France, ought certainly to be gratifying to the pride of the profession in this country. Mr. G. as is well known, is a native of and practiced his profession for many years in the United States, and had acquired a high reputation for skill, previously to his going to England. He was, therefore, deserving of all the confidence and patronage with which he has been honored in that country.—*Balt. Ed.*

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*Gossip with our Profession: by the Junior Editor.*—He who will give distinct, simple, and easily understood names for all the normal elevations and depressions, aspects and surfaces of the human teeth, will do the profession a service. The nomenclature once generally adopted, would make the reporting of cases much more easy to the reporter, and the report would be much more easily understood. Every dentist knows how difficult it is to describe his operations, even to one of his own profession. \* \* \* \* We often hear it said, "If I cut down to the alveolus, all around a tooth, I cut all that can be cut," &c.; but close and long continued observation, and much practice, have taught us, that the strongest attachment that can be cut, is generally *not* cut—even though the operator do "cut down to the alveolus all around." As a proof, observe the little glistening fibrous mass of flesh upon one or two sides, near the crown, of nine-tenths of the teeth you extract, after "cutting down all around" them. We cut thus: suppose we are to extract an inferior molar; we take an instrument with a blade like that of a penknife—narrow, straight on the back, tapering to a point, and very sharp. With the handle elevated some thirty or forty degrees, we insert the point, *with the back down*, through the gum about a line from its margin, outside the arch, opposite the anterior side of the tooth, and pass the blade through toward the tongue, with the point of the blade in the socket of the tooth. We do the same with the opposite side of the tooth; and then with a very narrow curved lance, we *cut down* in the usual manner on the exterior and interior sides. We make no pretensions, however, to cutting any *ligament*, or

any other *generally* very strong attachment, by our method. Since a most unpardonable deception by the pretended discoverer of the *ligamentum dentis* upon *ourselves*, (the immediate consequences of which were such as we hope never to feel again, and the ultimate consequences we are yet in great fear of,) an operation performed to convince us of the existence of that ligament; our estimation of both the discovery and the discoverer has sunk considerably *below* zero—the point *at* which it stood before. \* \* \* \* In the earlier years of our practice, it was our misfortune (and our patient's also) to have the operation of engrafting teeth upon fangs frequently followed by pain, swelling of face, &c. We tried all the harmless prescriptions for prevention, or remedy, that we could hear of, but without satisfaction. A groove in the side of the *dowel*, (not *pivot*, gentlemen,) would afford an exit for the matter collected, or rather *deposited*, in the fang, and thus prevent the formation of an abscess at its apex: but we have become convinced by some years' practice in our *present* treatment of fangs, preparatory to engrafting crowns upon them, that this matter in the fang is the cause of the after-trouble in a vast many cases. If the nerve be not already dead in the fang, we destroy it *entirely*; and, in all cases, plug the fang with gold, from the apex to the end of the dowel. This prevents the stagnation and horrible fetor of animal matter within the fang: and, in our practice, not only prevents subsequent disease almost always, but will put an end to disease already existing in a great many cases where the common practice has been followed. \* \* \* \* The question has been often asked us, "have you used platina plate, and if so, do you approve of it?" We have used it. In some cases where we wished a purer material than gold solder, we have used platina plate, and, instead of solder, have used gold coin, which will *flow* upon platina very beautifully. We confess, however, that platina has weighty objections; it is heavier and less elastic than gold, and not so easily wrought. The difference in cost between the two metals, we have found to be more than counterbalanced by the difference in the labor which they respectively require to work them. \* \* \* If there be any of our profession who have not yet used the grinding wheels made of shell-lac and emery, (such as are sold at Stockton's establishment,) we would say to such *try them*:—and if they *do* try them, they will give their old grind-stones to the children to play with. \* \* \* \* We take some little credit (with all due modesty) for pointing out the use of the *rugæ* in the anterior portion of the *roof* (the term is expressive) of the mouth. They aid *very materially* in producing all the hissing sounds—as of c, s, z, &c. &c., by allowing the tongue to rest steadily *against* them while they admit a passage of air *between* them. And now for the practically valuable results of the discovery: when we must use wide dental plates, if these *rugæ* cannot be stamped up, they should be soldered on. \* \* \* \* There are unmentionable associations connected with the *syringe* in its common shape—a serious objection to its use about the mouth. The objection is removed, by so altering its form that it may not be recognized as a

*synges* by the patient. We have one of those pear-shaped gum-elastic bottles, or sacks, such as are sold by the apothecary, which will contain, perhaps one-fourth of a gill: in the neck of this is fastened one end of a silver tube, two inches long and one-eighth of an inch in diameter; to the other end are fitted several thin tubes, of different curves and sizes. When we would use the instrument, we collapse the sack by pressure in our hand—insert the free end of the larger tube into water, and uncloze the hand—when the sack will regain its former shape, filled with water. The small tube we would use, is now inserted, and the syringe is ready for use—the water being forced out at pleasure by merely closing the hand that applies the instrument. When neatly made it is far preferable to those in common use, on account of its convenience, appearance and its simplicity; and it does not cost one-fourth as much. \* \* \* \* Will some one furnish us with a specimen of “internal caries of the teeth”—not caries around the cavity of a dead nerve, but such “internal caries,” as is so minutely described by some of our “popular authors?” We never saw a case, and, with all respectful deference for the opinions of said authors generally, and, for that of Professor Dunglison particularly, who says, (in his review of Robinson’s excellent work,) that caries *always* commences *within* the tooth; we doubt that such caries ever existed. We feel pleasure in adding that there are *many* others of our profession, who are of our way of thinking in this matter. \* \* \* \* We have in our possession a curiosity, entitled an “Essay on the Teeth.” Its author says the decay found in the grinding surfaces of the teeth, is the consequence of *grits* lodging in the depressions, and grinding holes through the enamel!—and that the decay found upon the sides of the teeth is accounted for by the *fact* [!] that at those places there is a deficiency of enamel, the teeth being *in contact*, when the enamel is deposited!!! The profundity of his dental research strikes us with inexpressible astonishment. Why, the man nearly equals that old Dutch anatomist, who says the roots of the first teeth, are the seeds from which the second grow! M.

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*Errata.*—In Comments upon Dr. Harris’ Essay, p. 256, vol. 4, first paragraph, third and fourth lines should be transposed.

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ARTICLE I.

*Case of Dr. John Stoughton Wolcott, of Litchfield, Conn., son of the late Oliver Wolcott, for many years Governor of that State, and grandson of Oliver Wolcott, one of the Signers of the Declaration of Independence.* By SOLYMAN BROWN, M. D., D. D. S.

THE recent announcement, in the public newspapers and medical magazines, as well as in this Journal, of the death of this gentleman, in the outset of his professional career, "*by the application of arsenic to the nerve of a tooth,*" was well calculated to attract the attention of the writer, who was once the private tutor of Dr. Wolcott, and his fellow townsman. As one of the editors of the only Journal now in existence devoted exclusively to the interests of Dental Science, I felt it to be my duty to inquire into the facts of the case, for the purpose of making them known to the profession, for the common benefit of the human family. I felt convinced that the real facts connected with the melancholy demise of my early friend, were particularly important to my professional brethren, and to the public who employ their skill for the relief of one of the most intolerable of mortal maladies—THE TOOTH-ACHE. Under these impulses I addressed letters of inquiry to two physicians of acknowledged skill and reputation, giving a list of interrogatories, to which I solicited categorical replies. Both these gentlemen, Dr. R. M. Woodruff and Dr. J. G. Beckwith, in a manner which evinces their regard, not only for the truth of science, but for the welfare of humanity, made prompt and satisfactory replies.



If one of these gentlemen has sedulously avoided an expression of his private opinion as to the true cause of Dr. Wolcott's death, it may be ascribed either to a desire to give *facts* and *symptoms*, in order that gentlemen of the dental and medical professions might draw their own conclusions; or to a modesty which is equally creditable both to his head and heart. He might, moreover, have been unprepared, at the time, to contradict the opinion of his patient, on the one hand, or to inculcate the dental operator who had applied the arsenic to the tooth, on the other. I shall lay before the profession the communications furnished by these gentlemen, and by other physicians of the village of Litchfield, in the order in which they were received, taking this opportunity of tendering to them my sincere thanks, as Editor of the American Journal of Dental Science, and Secretary of the American Society of Dental Surgeons, for their prompt and laborious kindness in furnishing the following facts and documents in the case.

*Litchfield, Dec. 13th, 1843.*

DR. BROWN,

Sir—Your letter to my brother, Geo. C. Woodruff, Esq., requesting "the facts connected with the sudden decease of Dr. John S. Wolcott," has been handed me to answer. In reply, I will first state that for some time previous to the doctor's last illness, his health had been quite good; indeed, he remarked to me some eight or ten days before his attack, "that his health never was better." And upon inquiry I am informed by his nephew, (who resided with him,) and also by his housekeeper, that "until he first complained of tooth-ache he enjoyed perfect health;" so far as they could judge: he ate and slept well, made no complaint, and exhibited no symptom of the least ill health. The Friday evening previous to his attack, I was for some time with him; he was in fine spirits and apparently in good health. On Saturday following, he also appeared the same, and it has been remarked since his death, by some who spent an hour or more with him Saturday evening, that "they seldom saw him more cheerful than he was at that time." I have been somewhat particular in my inquiries respecting the doctor's health previous to his attack of tooth-ache, for the purpose of ascertaining or satisfying myself whether the symptoms which were presented during his illness, could be attributed to any cause existing previously: and from all the information which I have obtained, I have no doubt, that until Saturday evening, November 18th, he was in *good health*, and showed no symptoms which could be supposed to have been the cause of his illness. On this evening, (November 18th,) he retired at his usual hour, about half past nine o'clock, and after remaining in bed about one hour, he requested his nephew, who slept in an adjoining room, "to get him

some laudanum, as his tooth ached," he applied the laudanum to his tooth, and soon after fell asleep, and slept till morning. On Sunday morning he arose early, ate his breakfast as usual, made no complaint, and went to his office. At about nine o'clock, he again complained of his tooth, but soon went out to visit his patients: about noon he returned to his house, said, "his tooth ached, and he had been to the dentists to have it taken out, but he did not pull it, but put something into it." He sat down to dinner, and after eating a few mouthfuls, he asked for a pin. He applied the pin to his tooth, and when he took it from his mouth there was something white on the point; he laid the pin and what he took from his tooth on the table, which one of his family examined after the doctor left, and said "it looked like wax." He ate but little dinner, left the table, and went to bed, and remained there until about three o'clock, P. M., when he got up and again complained of his tooth, and continued doing so until about seven in the evening, when he again went to the dentist and had the tooth extracted, which gave immediate relief. He returned to his house and went to bed at his usual hour, and lay there through the night. On Monday he arose earlier than usual, his face a little swollen, appeared to feel quite anxious about something, looked in the mirror often, ate but little breakfast, made no complaint, went out visiting patients, told some of them that "he was sick and ought to be in bed;" returned about noon, called at my office to see me, I was absent, and he went home, ate no dinner and went to bed sick, appeared in great distress, vomited two or three times in the course of the afternoon, very thirsty, cramp in his limbs, frequent sighing, made an effort to pass his water without success, swelling of the face a little increased since morning. The above particulars I have from himself and his family: at about five, P. M., he sent for me. I went to him immediately, found him in bed, right side of his face opposite the inferior jaw a little swollen and severe pain in it; great distress at his stomach, constriction of the throat, difficult swallowing, and labored respiration, pulse 130, lips parched, great thirst, chilly, a sensation of stiffness of the whole body, and also of debility, said, "he was fearful he should have convulsions;" great anxiety of countenance, and some stupor of mind, I inquired what was the matter, he replied, "I have had arsenic in my tooth, and am poisoned." Nine o'clock—had during the evening frequent vomiting, thirst and distress at stomach aggravated, articulation indistinct, and no mitigation of any symptom—one o'clock Tuesday morning, symptoms generally more severe, cold chills frequent, pulse 135, by the active use of such remedial agents as his case required, he became more quiet at about three o'clock, A. M., and soon after fell asleep and slept about an hour, awoke somewhat relieved, retained a little food on his stomach. At eight o'clock, A. M., pulse 130, had felt no disposition to spasms since three o'clock, had passed his water twice during the night with great muscular exertion. Other symptoms as in the evening previous, except the swelling of the face increased, at about ten o'clock his face commenced swelling alike on each side, and swelled with great rapidity, respiration much more laborious than

at any other time, frequent sighing and vomiting, countenance expressive of intense anxiety, and with the exception of spasms, the severity of his symptoms became more and more severe through the P. M.; at five o'clock the swelling extended from behind the mastoid process on each side, far up on the temporal and frontal bones, and around his neck, filling it out to the chin and about the face so as to almost close his eyes. Lips greatly distended, parched and livid, vomiting almost incessant, thirst unquenchable, pulse irregular, distress at stomach great, and copious secretions in the throat, at about eight o'clock the swelling of the face appeared to be arrested, but no farther mitigation of his symptoms, he passed the night without any favorable change, or getting any relief, towards morning the powers of his system appeared to be yielding, efforts to vomit were not so effective and were less frequent, swelling of the face a little less, pulse quite irregular, under the influence of stimulants, which he would retain for a short time, he would revive a little but soon sink, he continued much the same except sinking more and more until about eleven o'clock, Wednesday morning, when he died.

I have, I believe, stated all the facts of any importance in relation to the case of Dr. Wolcott, unless it is in relation to the state of his bowels. On Tuesday morning after becoming more quiet he took castor oil, and I don't know that he vomited it up; about four o'clock in the P. M., he had a movement, but the stool was thrown away without being examined, on Wednesday morning he made an attempt to have a movement, but without success, his bowels were considerably distended, when he died. I was with him most of the time from Monday evening, until he died, and the statement above is a true history of his case.

I will further state, that some five or six years since, Dr. Wolcott by using arsenic in preparing the skin of an animal for stuffing became poisoned, and had extensive swelling of his face, neck and hands. In his last illness he frequently told me that "he was now poisoned by arsenic," called for antidotes, &c., and did not appear to have any doubt but that the arsenic which was applied to his tooth, was the sole cause of his illness. After his death, the dentist showed me the tooth, and told me that "the arsenic was placed directly on the exposed nerve," and upon examination, I saw that the tooth was decayed fully down to the hole, through which the nerve passed. He also informed me that the substance applied, was composed of arsenic wet with creosote sufficiently to form a paste.

Believing that the above will be a satisfactory answer to your interrogatories,

I remain your obed't servant,

R. M. WOODRUFF.

Enclosed in Dr. Woodruff's letter, was the following from Mr. Oliver Wolcott, nephew of the deceased, who was requested to make a statement of the facts known to him personally, by Geo.

C. Woodruff, Esq., postmaster of the village, who has kindly contributed to the investigation of this case.

Dr. BROWN,

I have been requested, among others, by Mr. George C. Woodruff, to state what I know respecting the symptoms of my late uncle's case. All the information which I possess on the subject I have given to Dr. Woodruff, together with what I obtained from Millie, a faithful old colored woman, who lived with us. I have seen a letter which Dr. Woodruff intends sending to you, containing the symptoms, &c. I do not hesitate to say that it is entirely correct. I was with my uncle during the whole of his illness; he called me up on Saturday night for some laudanum, which he put into his tooth, and soon fell asleep; I sat up with him from Monday, five, P. M., until Tuesday, seven, P. M., when, being perfectly exhausted, I was relieved. His health, during the eighteen months that I have been studying with him, was never better than during the summer and fall of this year. He rose very early, worked in the garden, &c. and congratulated himself on his good health. There was no previous indisposition, to the tooth-ache of Saturday night, that I am aware of, at least I heard no complaint whatever. In conclusion, let me say that the facts are all embodied in Dr. Woodruff's letter, in whom I place the greatest confidence, and who has been my uncle's physician for six years, and who was well acquainted with his constitution, treatment, &c. I remain your obd't servant,

OLIVER WOLCOTT.

P. S. Perhaps it would not be amiss for me to say that my uncle told me the same as he did Dr. Woodruff, or nearly so, "that arsenic was the cause of his illness," (which he also told one other person.) This he told me on Tuesday morning.

The following letter, from Mr. Merriman, the respectable dentist of the village of Litchfield, accompanied the two preceding.

*Litchfield, January 3d, 1844.*

Dr. SOLYMAN BROWN,

Dear Sir—The following statement of facts, which came under my notice, in relation to the death of Dr. John S. Wolcott, I have already submitted in substance to George C. Woodruff, Esq., by his request; but I will now give a few more particulars in relation to the tooth, and the doctor's conversation with me. Supposing, from your letter, that possibly it might not have reached you, I cheerfully give my testimony to the dental profession, knowing that my course will be approved or not as it shall truly deserve.

On Sunday, November 19th, about one o'clock, P. M., Dr. Wolcott called on me, laboring under a severe tooth-ache which he had had at intervals for the last fortnight, at the same time complaining of flying pains in his limbs and stomach, occasioned (as he said) by a cold which he had taken while su-

perintending his outdoor affairs. At his request, I applied a preparation composed of two parts arsenic and one of morphine, in powder, which had been slightly moistened with creosote a fortnight previous, but nearly dry at this time. He made some inquiry respecting the mixture, and appeared satisfied with my answer. The two right bicuspides of the inferior maxilla were decayed between their adjoining surfaces, and partly broken away, leaving a space of a line at the top of the crown and half a line near the gum, the seat of pain being in the second bicuspid, with the cavity facing the first, above the gum, and sufficient space to allow of inspecting the cavity and its contents with my eye. The two molares next this tooth had been extracted, and the jaw and gums had every appearance of health. It seemed desirable to save the remaining teeth, and I commenced removing the soft portion of bone lying over the nerve, that the arsenic might act quickly upon it; but from its increasing the pain, was obliged to leave it but partially cleansed of soft bone, though it was quite dry from moisture. A piece of cloth being laid around to cover the exposed parts of the gum, I inserted about one-twelfth of a grain of the preparation into the cavity, upon a small pointed instrument. It was then covered with wax perfectly free from air or moisture, or contact with the gum, and as a further security I placed a wedge of wax between the two teeth, cautioning the doctor not to eat upon this side of his jaw. He inquired what time would be requisite to give relief, and I said four or five hours, or before night. He told me that he should give up and place himself on the invalid list, if he had not so much to attend to that he could not afford to be sick, and then left to attend to his professional duties. In the evening, about seven o'clock, he returned to my house, complaining that there was no alleviation of his pain. Both the first and second call were made in presence of my wife and her sister, and this time he seated himself by the table, on which a light was burning, and made some prescriptions for Mrs. M., who had been ill some days with cankered mouth and throat, with slight swelling of the glands. The doctor was in the sitting room near half an hour, the room was warm, and he amused us by his gestures and remarks, which were grave and witty alternately, as a spasm of pain or freedom from it predominated, at the same time making with his knife a swab to use for Mrs. M's throat. In the course of these remarks, were the following, more particularly worthy of notice. Said he, "If you had seen the old gentleman (meaning himself) the other morning, you would not have known him, for when I looked in the glass I did not." "He was a beautiful looking man," making at the same time a gesture with both hands around his face, signifying fullness or swelling. His object in waiting was partly to allow time for the arsenic to act upon the nerve, and, no doubt, in part also from the unwillingness every person manifests to be dismembered of a tooth. Before seating himself in my office, which was destitute of a fire on Sunday, he removed from his neck a large shawl, and laid aside his overcoat and coat, as was his custom in such cases previous. On his holding the light, I examined the mouth, noticed that the wedge of wax

was gone from between the teeth, but found the wax over the cavity, and removed it and also the arsenic in a careful manner; it appeared of the same amount and dryness as when applied. There was no sign of abscess or inflammation about the teeth. After cutting the gum, I stood on the left side of the patient, raised my arm over his head, and extracted the tooth with a pair of straight forceps. While the doctor was spitting and rinsing off the blood, I examined the tooth, and found the soft bone between the arsenic and nerve. On lifting it with an excavator, a very slight opening could be made by force into the centre of the tooth, three-eighths of an inch long, and admitting the edge of a knife. No sign of disease like abscess was to be seen on the point of the root. But now, for the first time, the doctor said "he was relieved," "was a new man," &c. and "thought he could sleep to-night." After rinsing his mouth well with cold water, and taking his things, he left, much satisfied with the result; was in my office perhaps half an hour in all. The next Monday afternoon, twenty-six hours at least from the time of application, he called me into his office, and requested the extraction of another tooth, viz. the first bicuspid before mentioned. But I declined this, and asked him if he slept any the night previous, as he expected. He said "no, he had not slept for three nights, and he could not stand this pain." "What shall I do then?" I told him his case needed the doctor more than the dentist, for he owed to exhaustion from want of sleep, riding in the winds, fatigue of mind and body, together with wet feet on Friday, and tooth-ache, combined with pains about his limbs, back and stomach, and that, however reluctant, he would have to rest, and procure sleep and quiet by anodynes and local applications. At length he determined to try these remedies; but suggested a resort to the forceps if they were unsuccessful. I heard no more from him till the evening of Tuesday, when I was informed it was the opinion of his physicians that he could not long survive. He died on Wednesday, A. M. Respectfully yours,

R. B. MERRIMAN.

P. S. When I learned that it was rumored the doctor died from application of arsenic, I requested a post mortem examination, and I am very sorry this request was not acceded to.

R. B. M.

Dr. Beckwith has read the above statement, but on account of ill health I am unable to see the other physicians.

R. B. M.

The next communication which I received on the subject, is from Dr. J. G. Beckwith, and is as follows:

*Litchfield, Dec. 25th, 1843, 9 o'clock, P. M.*

S. BROWN, A. M.

Sir—Your favor of the 22d inst. has just come to hand and I avail myself of a private opportunity by Mr. Perry, a medical student, who goes to the current lectures at the University in the morning, to say to you, that I will investigate the facts in relation to the late death of Dr. John S.

Wolcott, with pleasure; in the meantime, would say that it will appear on investigation, that his death was not in any way attributable to arsenic as an agent, that the quantity used was too small to have produced death, even if taken into the stomach, that it was carefully applied by the dentist, and covered with wax, that he removed the wax and the filling, a few hours after the application, and extracted the tooth. The doctor being about until the afternoon of the next day, in the meantime exposing himself to the weather, and attending to his profession, and that neither locally nor constitutionally did he exhibit the legitimate effects of arsenic upon the system.

If it should be desirable, a statement can be made out, and would be signed by most if not all of our most respectable physicians, who saw him during his sickness, substantiating the above facts, and exhibiting cases where death has occurred with symptoms very similar to the doctor's, where no arsenic had been used.

The Litchfield paper contained no such statement, and how it first obtained publicity in the Hartford Journal, from which it was copied into almost all the newspapers of the country, we cannot ascertain. The report was of a similar nature, with the paragraph which was found in almost all the papers in relation to the death of Dr. Boardman of Hartford, which I found on investigation, to be probably as little attributable to creosote, as Dr. Wolcott's to arsenic. His death also occurred from extensive and malignant inflammation of the cellular substance about the face and neck, of an erysipelatos character.

I deem it highly important that the facts should be made to appear, and if arsenic is very dangerous in its application, let its use be suspended. You, however, are well aware that the quantity necessary to destroy the sensibility of a nerve of a tooth is entirely powerless, as a poison upon the human system; but I am extending my remarks too far upon this subject at this time, I am very glad that you have been prompted to investigate this subject and believe that the investigation will make it appear that the article in question has been unjustly charged with the death of brother Wolcott. Any assistance I can render you in this investigation will be done cheerfully, please say how far you would like to extend the length of the article, whether a certificate from the physicians would be desirable or not.

In great haste, your friend and servant,

J. G. BECKWITH.

In a subsequent letter, Dr. Beckwith responds to my specific interrogatories, in the following explicit manner:

1st, as to the state of Dr. Wolcott's health? The doctor had previous ill health, as you will learn from the enclosed paper; was subject to erysipelatos attacks, and I once attended him, about two years since, when he was prostrated by an attack of neuralgia, commencing with tooth-ache, and relieved by the extraction of the tooth, after having been confined several days to his bed.

2. As to the length of time previous to the extraction?

You will notice the swelling of which he spoke, at his interview with Dr. Merriman, on the preceding Friday, it must of course have been some days antecedent to this time.

3. As regards the size of the cavity?

Dr. Merriman's letter is very explicit.

4. Was the wax removed by Dr. W., and then restored?

Probably not; as the wax would not have been found by the dentist in the same situation as he placed it, if it had been removed, and the arsenic would not have been found entirely dry if the cavity had been opened. The wedge of wax, spoken of by the dentist, was probably removed, as it was not found when the tooth was extracted; or the filling in the other tooth which pained him might have been removed, if the doctor himself had filled it. We learn from Dr. M's statement, that he wished another tooth extracted; he also mentioned to some of his patients, on Monday, that he should feel much better after another tooth was removed.

5. Did Dr. W. eat any thing while the wax was out?

This answer is embraced in the last answer to the last question.

6. As to the quantity of arsenic and morphine, and the situation of the cavities?

The communication is full and explicit on this subject; also Dr. Merriman's statement.

7. Were the symptoms manifested during the patient's illness, such as to indicate poisoning by arsenic?

We suppose that this question is fully discussed in the enclosed paper.

8. What medicines were administered by the attending physician?

No medicines, as I could learn, which had reference to the supposition that he was poisoned by arsenic.

9. Can arsenic, acting homœopathically, in so small a dose, destroy life, if all had been taken into the stomach?

The concurrent testimony of all text books on *materia medica* goes to show the safety of this quantity, as they always recommend the minimum dose, and a quantity which would always be safe to administer to a person having a peculiar susceptibility to the unfavorable operation of a medicine which might have an unfavorable or poisonous effect. This is discussed in the enclosed paper.

10. As to the fact of Dr. W's being formerly poisoned by dressing a skin is not referred to in the enclosed paper?

I was acquainted with the circumstances attending this poisoning, which was merely a superficial affair; by rubbing it on his forehead, he had an eruption, and the fumes had an unpleasant effect upon his olfactory nerves. It occurred a number of years since, and could have no influence in laying the foundation for a more violent effect of the poison upon the system at this time. Mr. E. B. Webster, of this village, assisted the doctor at the time, and corroborates the account I have given of the matter.



11. Was the patient himself a competent judge of the actual cause of his sickness and death?

He was not, probably, from the fact that he had a strong prejudice against arsenic, and was in so much pain and distress, that he could not judge coolly, and perhaps did not know the quantity used; he did not have any such impression when he last saw the dentist, nor did he impute any blame to him; but from the violence and fatal tendency of his symptoms, it was not unnatural, nor in any degree surprising, that so potent an article as arsenic, where its tendency is evil, should be regarded as the unseen agent of his sufferings.

12. What other theory can be sustained, &c. as the cause of death?

Discussed in the enclosed paper.

13. As to the quantity which allopathic physicians regard as sufficient to produce death, &c.?

Two grains Dr. Beck mentions as the quantity which has produced it. You will notice in the paper, and other writers make mention of a larger quantity. (Dr. Beck mentions, vol. 2, p. 140, ed. 1823,) Dr. Petit, of Lyons, relates a person who survived after having taken half an ounce of arsenic, and he attributes it to the violent vomiting that ensued; so that if it were possible for the vomiting in Dr. W's case to have been the effect of the poison, it is itself important, as Dr. Beck mentions, in the same volume, (p. 140,) "I apprehend that the patient's vomiting or not vomiting has the greatest influence on the cause and variety of the symptoms: in the former case, the poison may be rejected before it has time to produce injurious effects, while, in the latter case, death may be inevitable; and again, the poison taken, may, from its quantity, or some other reason, itself produce vomiting, and thus prevent the fatal termination." He then adduces the case related by Dr. Petit.

14. What evidence that some of the poison was left in the tooth until it was extracted?

Dr. Merriman mentions in his statement, that he found it all there and dry, the best evidence in the world.

The certificates of Drs. J. G. Beckwith, Benjamin Welch, Jr. and Wm. Buel, all of the native village of Dr. Wolcott, and medical gentlemen of undoubted judgment and veracity, conclude the evidences in this interesting case.

*Litchfield, Jan'y, 1844.*

TO SOLYMAN BROWN, M. D.

Dear Sir—The disease which proved fatal to the late Dr. John S. Wolcott of this village, was so distressing and malignant in its character, and so sudden was the lamented result, that it might well lead to inquiry as to its nature and origin; and when it was known that an agent so poisonous as arsenic had been applied with a view to destroy the nerve of a painful

tooth, and that he himself entertained apprehensions that this was the cause, we might expect that a report, that such was the fact, would readily gain credence. That Dr. Wolcott entertained such apprehensions, is neither surprising or unaccountable, when we consider the influence of imagination excited by disease and suffering. It cannot be made to appear, how entirely without foundation in truth, is the opinion that arsenic was the cause of death, without a full and unreserved statement of facts in the case.

For a history of the symptoms to the time we visited the patient, we are principally indebted to Dr. Woodruff, the attending physician. He has communicated to you a statement of the facts as witnessed by himself. Dr. Welch first visited the patient on Tuesday evening, Nov. 21st, and remained in attendance, at the request of Dr. Woodruff, through the night. Dr. Beckwith saw him early the following morning.

When visited Tuesday evening, the whole face and neck were excessively swollen, red and painful, and the swelling extended downwards upon the upper part of the chest. Upon the sides of the neck, and in the region of the lower jaw, especially upon the right side from which the tooth was extracted, the swelling was hard and painful under pressure. The tumefaction of the face was so great, as nearly to close the eyes. The mouth could not, without difficulty, be sufficiently opened to protrude the tongue, or to allow an examination of the tongue and fauces. The patient spoke with difficulty, and then scarcely intelligibly. Deglutition was difficult and painful. Respiration laborious, and attended with mucous rattle in the throat, and the patient was frequently, by drinking warm water, irritating the fauces with an instrument, and by voluntary efforts, exciting vomiting, apparently with a view to dislodge the mucus, as he seldom or never vomited until some or all of these means were employed; the skin was cool and moist; pulse too feeble, irregular and frequent to be counted; great restlessness, and frequent tossing of himself about; made no complaint of pain in the stomach or bowels, or of tenderness under pressure, upon the abdomen; he has had several motions of the bowels by stool, the effect of a cathartic, muscular strength was sufficient to raise and support himself, upright in bed, and to support himself when helped from the bed with little assistance; voids his urine without any expression of pain or difficulty; no apparent delirium.

The treatment adopted, at this stage of the disease, and under circumstances so apparently desperate, can afford but little light in regard to its tendency, and therefore need not be minutely described. It was evident that the effusion of matter, if suppuration occurred, would not be preceded by adhesive action to prevent the matter from spreading, and would be attended with extensive sloughing of the cellular membrane. It appeared more probable that the patient must speedily sink from irritative fever, and exhaustion. Our only hope was in immediately arresting the tendency to suppuration, at the same time that we afforded the necessary support and quiet to the system. Several leeches were accordingly applied to the neck,

and the discharge of blood, promoted by cloths wet in warm water; also at the solicitation of the patient, the scarifier and a cup, two or three times repeated, were applied in the vicinity of the inflamed part. After this, the whole fore part and sides of the neck, and lower part of the face were brushed over with tincture of iodine. Internally small doses of tartarised antimony, and sulphate of morphine, and also Dover's powders, with one or two grains of sub-muriæ hydrarg., were administered; brandy and water, and other diffusible stimulants were allowed; sinapisms, and jugs filled with hot water, and warm flannels, were applied to the extremities. The patient was repeatedly cautioned as to the injurious tendency of so frequent, voluntary efforts and irritation to excite vomiting.

After this time, there was certainly no increase or extension of the swelling or inflammation, but rather diminished redness, tumefaction and hardness; the intervals of vomiting were more protracted and extended, from half an hour, to one or two hours. During these intervals, his medicine and such articles of drink and nourishment as were given him, were retained upon the stomach, and in moderate quantity; did not appear to excite uneasiness, but the patient gradually became weaker, efforts to swallow more painful, and in the morning, were attended with apparent sense of strangling. Thus retaining his reason till near the last, he expired at about 11 o'clock, on Wednesday, A. M.

To the intelligent dental practitioner, or the medical and surgical professions, the above statement, we believe, is all that is necessary, when the time, quantity and manner, in which the arsenic was applied, is known, but as you request us not only to communicate the facts, as witnessed by ourselves, but a history of the whole circumstances of the case with our opinion in regard to it, we will add the following statements, which are at your service, to dispose of as you think proper.

The disease was evidently erysipelatous inflammation of the neck and face, with tendency to diffuse suppuration in the cellular substance. We think there is fortunately sufficient evidence as to the true origin of the disease, independently of any influence arising from the action of arsenic.

1st. There is abundant evidence of predisposition arising from the previous state of the patient's health. He had, more than once, attacks of erysipelas; the Friday previous to his last illness, in conversation with his friends, he jocosely remarked, that "had they seen this gentleman in the morning, they would not have known him, as he did not himself when he looked in the mirror, his face being so swollen." On the next day, in an interview with another, he repeatedly exhibited evidence of double vision. His house keeper says, that for two or three weeks previous, he had been afflicted with inflammation upon his limbs, requiring poultices, &c. *which had, at the time of his illness, healed.*

2dly. The extraction of a tooth, in the forming state of inflammation of the jaw, is known, many times, to be followed by very serious aggravation of the disease, and even fatal consequences have resulted.

3dly. The day succeeding the extraction of the tooth, and when there can be little doubt that inflammation and fever, already existed, he rode several miles, in windy and uncomfortable weather, to visit patients. Exposure to cold is alone sufficient to excite fatal erysipelatous inflammation in the pre-disposed, and such inflammation is especially dangerous when seated in the neck and throat.

These circumstances it is contended, are fully sufficient to account for the disease. In illustration of our sentiments we may be allowed a single quotation. "The erysipelatous more than any other inflammation, following injuries, connects itself with peculiarities of constitutions, and gives the impression, from the seeming inadequacy of the exciting cause, and the sudden, rapid and destructive character of the disease, of its originating from some specific irritation."\*

We will state as concisely as possible, the direct evidence that the disease was not owing to the poisonous action of arsenic applied to the tooth.

We are not aware that any one who has with any intelligence examined the subject, supposes that the poison escaped from the tooth, and was inadvertently taken into the stomach. There is not the slightest evidence, either from the circumstances of the case, or the subsequent symptoms, to indicate that such was the fact. The tooth affected, and into which the arsenical preparation was introduced, was a bicuspid of the lower jaw, with a favorable cavity for the introduction of the remedy, and effectually securing it there, by a covering of wax, and we have no reason to doubt, the whole was judiciously, and skilfully performed by the dentist. We have no proof that any escaped so as even to fall upon the tongue, or mucous membrane of the mouth.

The attack of pain in the stomach and vomiting, referred to by Dr. Woodruff, did not occur until more than thirty hours after the application,

\* Erysipelatous disease is frequently epidemic. An instructive example occurred at Plymouth, Eng., and extended to the adjacent country, in the summer of 1824. Of fifteen cases which occurred at Plymouth dock-yard, and are related by Dr. Butler,\* twelve were fatal. In all these cases, the disease was excited by local injury, which served as a starting point to the inflammation. An epidemic erysipelatous disease has prevailed extensively, in the north and west parts of the state of Vermont, the last two or three years, and has been described by J. A. Allen, M. D.,† of Middleburg, and published in the periodicals of the time, and by C. Hall, M. D., of Burlington, Vt. and G. J. Dexter, M. D., of Lancaster, N. H. in the last January number of the American Journal of Medical Sciences. In this connection it may not be altogether unworthy of notice, that Dr. Wolcott, about four weeks previous to his death, attended a case of diffuse inflammation seated upon the thigh, and about the hip, which proved suddenly fatal. Also at the time of his death, two persons upon whom he had attended, were laboring under epidemic sore throat.

\* See Review of Butler's Remarks on Irritative Fever, &c. in American Medical Review and Journal, vol. 2, p. 325.

† See Topaz, published at Middleburg, March, 1842.

and twenty hours after the tooth was extracted, and the patient had, in the interval, repeatedly taken food. Could the operation of so virulent a poison be thus delayed, how tremendous would be the agent, for evil, in the hands of the designing. In cases of poisoning, we should have to inquire into the circumstances, not of the last, but of several previous repasts; there was an absence of symptoms of inflammation of the stomach and bowels, which must have existed, had a poisonous dose of the article been received into it, nor could the inflammation of the neck and face be at all explained upon such a supposition.

The whole quantity applied to the tooth, was not sufficient, if received into the stomach, to cause death. It did not exceed the ordinary dose as exhibited in intermittents, lepra, &c., that is, from one-tenth, to one-fourth of a grain; the dose has been increased when administered internally in the form of Fowler's solution, even to one-half of a grain with beneficial results.\* The dentist tells us that from one-eighth to one-twelfth of a grain of the arsenious acid, with half the quantity of morphine, moistened with creosote, is quite sufficient to destroy the nerve of a tooth, and is more than was used in the present case, the tooth having but a single root.

The more plausible supposition is, that the consequences resulted from the local action of the remedy. Cases have occurred showing peculiar susceptibility to its influence. The external, as well as the internal application of arsenic is, in sufficient quantity, known to be poisonous. But here, if strictly confined to the cavity of the tooth, it is believed there could be absolutely no absorption; if it escaped the tooth at all, there must have been the protection afforded by the lining membrane of the mouth, and skin covering the part through which it could only act slowly, and after the membrane was destroyed. Such a supposition assumes an augmentation of the susceptibility of the patient, extraordinary to a marvellous extent, and altogether beyond the reach of our credulity. We are not so fearfully made that an irritating agent like arsenic, is more fatal when applied to the surface of the body, undenuded of its covering, than to the peculiarly sensible and vital organ, the stomach.

Not only all theory, but all experience, is opposed to such a view of the case. In the multitude of instances in which it has been applied, in the same manner, by dentists, no such consequences have heretofore followed. The late Prof. Hosack, of New York, recommended it in his public lectures, as the most appropriate remedy for the destruction of common warts, in cases where the cicatrix resulting from its action would not be objectionable. For this purpose, many times the quantity necessary for the destruction of the nerve of a tooth would be required. Combined with opium and other substances, it is often applied, by the surgeon, directly to ulcerated surfaces, to change action in cases of lupus or cancerous ulceration, with entire safety

\* Prof. Beck has the following note. See *Medical Jurisprudence*, vol. 2, p. 181. "The smallest quantity of arsenic may prove injurious, and it is said that two grains have caused death."

and success. It is generally esteemed a safe and effectual agent for the removal of cancerous tumors of small size, where there are objections to the employment of the knife; and it possesses the peculiar advantage of not extending its operation upon the surface beyond the part to which it is applied. It is also the ingredient which constitutes the principal active agent in most of the cancer plasters and nostrums, so indiscriminately employed by empirics, and danger arises, in these cases, only from the continued or too often repeated application of the poison, in such quantity that it acts as a caustic.

There are also circumstances, in the case of Dr. J. S. Wolcott, which we believe distinguished it from poisoning by the external application of arsenic, quite independently of the quantity and the manner in which it was applied.

We have already trespassed so largely upon your patience, that we will direct attention only to a single point; this is, the disproportion in the amount of local inflammation, and disturbance of the nervous and digestive systems, which exists in the two cases. In the former, the malignity of the disease is marked, especially, by the intensity and extent of the erysipelatous inflammation, attended only by the ordinary symptoms of irritative fever, and, so far as we had an opportunity to judge, an amount of gastric disturbance not unusual in the disease. In the latter, there is either an entire absence of external inflammation, or it is in no measure proportionate to the violence or malignity of the general symptoms; which are characterized by paleness, faintness, paralysis, tremors, convulsions, disturbance of the intellectual faculties, coma, &c.

We are told that the symptoms of poisoning by arsenic "are similar, in all essential circumstances,"\* whether it is taken into the stomach or applied to a wound. Dr. Jaeger, of Stuttgart, in a summary of results derived from many experiments on animals, observes, that "when applied to the sound skin it seldom injured it. If applied to a wound, it never, after death, was observed to be gangrenous or *inflamed*, was *rarely swollen*, but *generally pale*."† The preparation employed in his experiments was chiefly a solution of the arsenious acid in water, in the proportion of one to sixteen.

Respectfully, yours,

BENJ'N WELCH, JR.

J. G. BECKWITH.

Having visited Dr. Wolcott in his last sickness, in company with Drs. Welch and Beckwith, and having endeavored, at the time, and since, to obtain information from other sources, of the various circumstances of the case, and now having attentively perused the above statement, I discover no reason for apprehending that his sickness and death were the effects of arsenical poison.

WM. BUEL.

\* See Beck's Medical Jurisprudence, vol. 2, p. 199.

† Review in Edinburgh Med. and Surg. Journal, vol. 7, p. 80—84.

## ARTICLE II.

*Case of Aneurism by Anastomosis of the Superior Maxillare.* By  
S. P. HULLIHEN, D. D. S., Wheeling, Va.

THE following case of aneurism by anastomosis, is reported more for the singularity of its situation than for any thing connected with its history, treatment, or cure.

In the autumn of 1841, Mrs. Stoneman, of this city, aged 22, pregnant with her first child, and having *nævi materni*, or mother's mark, on the left side of the nose and upper lip, showed me two small and very red protuberances or tumors of the gum, nearly of the same size. The larger was situated in the gum on the anterior surface of the alveolar process of the superior maxillare, and between the fangs of the central incisors. The smaller occupied the same situation on the posterior surface of the same process. A small cord-like enlargement ran from one tumor to the other, forcing the central incisors slightly apart. This constituted all the peculiarities of the case at this time.

The history of the case is as follows: during the first two months of her pregnancy, she had frequent and spontaneous bleedings from between the central incisors; after this, the small red tumors suddenly made their appearance, at which she became alarmed, and sought advice; but not being willing to submit to the treatment recommended, nothing more was heard from her until August, 1843. She was then five months pregnant with her second child, and had suffered much from frequent bleedings ever since the first appearance of the disease. The size of the tumors, *or rather tumor*, remained nearly stationary after the birth of her first child, until her second pregnancy occurred, and then it began gradually to enlarge, and was now the size of a filbert on the anterior surface, and about half this size on the posterior surface of the alveolar process. The cord-like enlargement or portion of tumor that passed between the central incisors, had so increased in size, as to force the teeth one-third of an inch apart, causing them and the lateral incisors to become very loose, sore, and painful. The tumor was at this time of a dark purple color, very soft, and pulsated as distinctly as the artery at the wrist. The capillary vessels on the upper lip were enormously enlarged,

some distance on each side of the median line. The appearance of the case is well represented by the annexed cut.



As the patient was now suffering considerable pain, and the bleedings from the tumor were so frequent and so profuse as to affect her health very seriously, an operation was determined upon, and performed in the following manner:

A strong pin was pushed deeply through a portion of the gum at the upper edge of the tumor on the anterior surface of the alveolar process, and parallel with the jaw. Another pin, after being bent to suit the arch of the jaw, was inserted in the same way at the upper edge of the tumor on the inside of the mouth. A strong ligature was then thrown around the ends of the pins, and carefully pushed down between the tumor and the teeth, drawn very tight, and secured by a knot. In this way the whole tumor was embraced in one ligature, and in a manner that prevented the ligature from slipping or becoming displaced. On the



second day the ligature was tightened, and also on the fourth and fifth. On the sixth day the tumor came away, and not a vestige of the disease remained. The parts healed up rapidly; the teeth gradually resumed their natural positions and became firm. The enlargement of the capillary vessels entirely disappeared, and the mouth is now free from all appearances of disease.

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### ARTICLE III.

*Contributions to Operative and Mechanical Dentistry.* By W. H. ELLIOT, Fellow of the American Soc'y of Dental Surgeons.

No. 3.

#### ON THE PIVOTING METHOD OF INSERTING ARTIFICIAL TEETH.

THIS particular branch of the dental art is so well understood at the present day among the more enlightened members of the profession, that there are few errors in general practice to be corrected. I shall therefore confine myself more particularly to the instruments with which the operation is performed.

*Cutting Forceps.*—The excision of a tooth is an operation which cannot be safely performed with the instruments in common use, especially if the neck of the tooth be sound and healthy. Dr. Harris recommends filing the tooth about half off, before the forceps be applied; this, when practicable, renders the operation less liable to accidents, but when filing is impracticable, there remains but one alternative,—the operation must be performed with the forceps, be the consequences what they may.

It must be evident to every practitioner, that the profession should be supplied with an instrument which can be used on all occasions without risk of injuring the vitality of the root, by the violence of the concussion, or by wrenching the tooth from its natural position during the operation. To effect this, the instrument must be sufficiently strong to prevent it from springing; it must have a multiplied lever power, so as to require less effort on the part of the operator; and lastly, it must be so constructed that any irregularity in the motion of the hand, which gives the force, will have no effect on that part of the instrument which is applied to the tooth.

The instrument used by the writer, is a common cutting forceps, with the addition of a steel shaft, about three inches in length, and one-fourth inch in diameter, having upon one end a handle like that of a common key instrument, and upon the other end an elongated head, about one-half inch in length, standing like the handle at right angles with the shaft. One extremity of this head, is attached to one of the handles of the forceps about four inches from the joint of the instrument, by means of a little stirrup or link; the other extremity of the head is attached to the opposite handle by the same means. One or both of the stirrups should pass through the handles of the forceps, and be fastened by means of a screw-nut, so that the capacity of the instrument may be altered. In use, the instrument is placed upon the tooth, and held there by the left hand, while a rotary motion is given to the shaft with the right, which brings the handles of the forceps together with a force almost incalculable. The stirrups which connect the shaft with the handles of the forceps, should be made to play about loosely, so that any irregularity in the motion of the right hand, will not move the cutting part of the instrument.

*Destroying the Nerve*.—May be most effectually done, by plunging into the cavity a bristle or bit of whale-bone, large enough to fill it. Either of these materials are preferable to a metallic instrument, for the reason that their elasticity will allow them to follow the canal of the nerve, although they may not have received the right direction from the hand. The amount of pain given depends entirely upon the length of time occupied in plunging and withdrawing the instrument.

*Filing the Root*.—Much pain and uneasiness may be saved the patient by holding the finger nail or some thin instrument against the end of the fang, as long as any of it remains above the gum; and afterward by pressing gently with the finger upon the gum opposite the root.

Aside from the condition of the root, a greater part of the irritation produced by the use of the file, depends upon the weight of that instrument, therefore the round or oval file should be abandoned for the thin file having one plane and one convex surface.

*Drilling the Root*.—Of all instruments ever used for this purpose, the common four or five sided broach is the least fit. Being

as large or larger above than it is at the point, the slightest irregularity of the hand is keenly felt by the patient; and without a possibility of clearing itself, it forces its own chips in advance against the wounded nerve; thereby giving additional and unnecessary pain. Both of these evils may be remedied by making the drill of a proper shape.

The head or cutting part of the drill should be turned in the form of an egg, the small end serving for the point of the drill. This head should be filed into four thin teeth; the shank should be about one fourth as large in diameter as the head of the drill, so that it need not come in contact with the root while in use. When a greater number of teeth are made on the drill, it will not clear itself with facility, when a less number, it is liable to jar.

If a bow be used for propelling the drill, the handle should be placed in the centre, at right angles with it, so that a simple motion of the wrist will be sufficient, without moving the whole arm, as is the case with the common bow.

To prevent the slipping, or wearing of the cord, two cords should be used instead of one, so that one will be running on to the pulley, while the other is running off, and vice versa, like the cylinder of a wooden clock. Each cord should also be provided with a guide.

*Fitting the Crown.*—A stone or cylinder about three inches in diameter should be used for this purpose, which will give the crown sufficient hollowness to prevent it from rocking on the root. To secure this object it has been recommended to sink the end of the fang around the orifice; this is certainly a very unscientific practice, for it not only forms a chamber for the retention of extraneous matter, but it places the natural decay of the root, a year or two in advance; for that portion of the stump which is removed by the counter sink, is the first to be attacked by disease.

*Materials for Pivots.*—In all cases where the root occupies a natural position, condensed hickory is the most suitable material for a pivot; unless indeed the root be broken or otherwise injured so that the crown cannot be brought to an accurate and firm bearing upon all parts of it. Under such circumstances the me-

tallic pivot is the only one that will offer much resistance to lateral force.

In case a root occupies an unnatural position, I refer the reader to the very excellent method recommended by Dr. Solyman Brown.\*

For the purpose of knowing exactly where the pivot should be soldered into the plate, a piece of iron wire three-eighths or half-an inch in length should be accurately, yet loosely, fitted to the opening in the fang, and before taking the cast, it should be placed with about half its length in the root, the rest projecting out. On withdrawing the cast from the jaw, the wire will be found in the wax—on removing the wax from the plaster, the wire will be found in the model—on removing the plaster from the lead, the wire will be found in the counter model—and on separating the two metals, the wire will be found in the tin model of the mouth, occupying its true position. The plate may now be prepared and slipped on to the wire which will hold it in its place while it is receiving the impression.

A metallic pivot may be fastened temporarily in the root by a bit of sheet lead, bent around it in the form of a tube, and of sufficient thickness to fill the orifice of the fang. For fastening the pivot permanently, the shavings of hickory, after being compressed between two smooth plates of iron, heated to about two hundred and fifty degrees Fahrenheit, may be used instead of lead.

In case it becomes necessary to give egress to matter through the root, the metallic pivot may be made in the form of a tube, or if hickory be used, a fine gold tube of sufficient calibre to receive a bristle, may be placed in the centre or side of the pivot, and an opening continuous with the tube should be made in the back of the artificial crown.

The practice of placing foil between the root and the crown is erroneous; for if it were possible to exclude the fluids of the mouth by such a course, the operation would most certainly fail. The pivot not being supplied with moisture, would not expand, and consequently would be liable to be displaced.

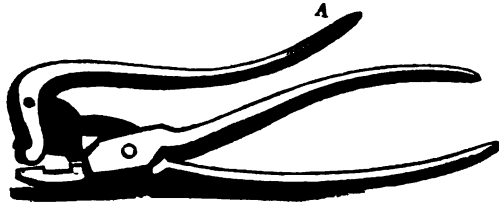
*Removing the Artificial Crown and Pivot.*—To remove the crown, a small instrument in the form of a double wedge may be

\* Journal, vol. 2d, page 168.

forced in between it and the root, one half of the wedge passing upon one side of the pivot, and the other half upon the other side.

Should the pivot remain in the root instead of being brought away with the crown, it may be removed with an instrument like the cut below, without pulling upon the fang a single ounce.

When the jaws of the instrument are firmly fixed upon the pivot, it may be extracted by pressing down lever A.



In case the pivot be broken, and a part of it remaining in the root, a small pointed instrument resembling a twisted gimblet without a screw, may be used with safety. This instrument not only cuts rapidly, but follows the fibres of the wood, and is therefore easily directed, so as not to cut away the substance of the fang.

NOTE.—The writer begs leave to express his gratitude to Dr. Harris for the very gentlemanly manner in which he has treated his answer to the note appended to his first article. He is aware that the opinion of the annotator, when taken alone, is sustained by the authors quoted, yet when coupled as it is in the note, with the assertion, that he is in error in regard to the *originality* of his views, and used as it apparently is to prop that assertion, it may have a widely different meaning from that of the quotations in question, and therefore, in that case, cannot be supported by them.

If in complaining, he has complained too loudly, it is only attributable to pain he felt, at seeing his first offering upon the shrine of his profession, characterised by such an accusation.

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#### ARTICLE VI.

*Extracting Forceps and Key.* By W. W. H. THACKSTON, D. D. S.

WE were somewhat surprised to find in a communication from Dr. W. H. Elliot, on the "extraction of teeth," addressed to the "American Journal and Library of Dental Science," the following paragraph: "I cannot agree with Dr. Shepherd that he who has

the ability to safely use the key, should not exchange it for any other instrument; nor with Dr. Thackston, that the key should be abandoned entirely. The latter gentleman proves clearly enough that the fulcrum must rest upon the gum in his supposed case, but unfortunately for his argument against the key, he stopped short of telling us how that operation might be performed with the forceps.\*

This paragraph refers to an article in reply to a communication on the "turnkey," from my excellent and esteemed friend Dr. Shepherd, written during the period of our studentship; which remark, however, be it distinctly understood, we do not make by way of apology for the doctrine therein maintained; for in a subsequent studentship, and practice (not *quite* as extensive perhaps as Dr. Elliot's) of several years, we have seen nothing which would impel us to a recantation of any single proposition contained in that article; on the contrary, we have experienced the most conclusive evidences of the truth of the principles which we then, in our humble manner, set forth.

In reply to the latter clause of Dr. Elliot's paragraph, as above quoted, we have only to say, that we are at some loss to reconcile the obtuseness of perception, evidenced in the present instance, with the acumen and sagacity displayed by him on other occasions; it is true that we did not, in the article alluded to, state exactly how the force should be applied, or what motions should be given the forceps to effect the evulsion of the teeth, for two very simple and satisfactory reasons; 1st, because the manner of the extraction of the teeth was *not* the point at issue; the subject under discussion being the adaptation and applicability of the instruments usually *employed* in this operation; and 2d, because the presumption with us then *was*, and *now* is, that any one who knew the difference between a turnkey and a pair of forceps, or at least who was at all familiar with the articulation of the teeth, and their anatomical relations, would be at no loss to know how safely to apply the force requisite for their dislodgement, after an effectual hold had been secured; which latter object, I trust, Dr. E. found amply provided for.

We will here, by way of expiating our (in Dr. E's judgment)

\* Vide Am. Jour. and Lib. of Dental Science, vol. 4, p. 48.

unfortunate omission, refer him to nearly every work *extant* upon operative dentistry, and especially to Prof. C. A. Harris' and L. Kœcker's instructions on the extraction of teeth with the forceps. All authors since the introduction of improved forceps for this purpose, are, we believe, generally agreed upon the manner of their application; for the removal of the double teeth, the *molares* and *bicuspidates*, the requisite motions are an internal, an external lateral, and perpendicular, or as near so as practicable; instead of the lateral motion for the front teeth, the *incisores* and *cuspidati*, they should be rotated, and afterwards removed in the same manner as the *molares*, that is perpendicularly. In this way we may, with the improved forceps, the common, pyramidal screw, the punch, elevator, &c. &c. remove all teeth or fangs, we think, with more ease and facility than with a combination of key and forceps, the key alone, or the lead and rod method, with which Dr. E. seems so much enraptured, but which, to us, appears, we confess, peculiarly objectionable.

In conclusion, we will observe, that we are highly gratified at the inquiring spirit, and disposition to cultivate and improve our science, manifested by Dr. Elliot; such a spirit is praiseworthy and noble, and should be emulated by all; but we will add, that it can never be fostered by illiberality and injustice, and we hope that our friend, Dr. E., will not again inflict that upon us, which he so much complains of in others, viz. unfairness, misrepresentation, &c. &c. We wish the doctor a large accession to his already *extensive* practice, and much success in his scientific investigations.

NOTE.—We are unable, at this moment, to lay our hands upon the article of Dr. Thackston to which Dr. Elliot alludes; but it is our impression that Dr. E's inquiry was, not how the forceps were to be applied in ordinary cases, but to such teeth as presented but one side above the alveolus;—a matter upon which, we confess, we should be glad to be enlightened ourselves.

M.

## ARTICLE V.

*The Paramount Importance of a thorough Dental Education, and the necessity of union among the profession to support the existing Institutions for its Dispensation.* By JAMES D. McCABE, D. D. S.

THE present is emphatically a day of reform and improvement; progress is written upon every page of the world's present history, as it is turned to view by the hand of time. The arts and sciences are developing their vast resources, and approximating the goal of perfection—every department of life breathed upon by the pervading spirit, unites in the race after excellence. Old systems are being exploded, or else so strangely changed by the new life infused into them, as to be scarcely recognized in the new forms with which they appear. The age of iron is fast passing away, and the true golden age of the world begins to dawn around.

He, who like the Ephesian sleepers, has for the last quarter of a century indulged in a temporary oblivion, awakening now, would scarcely distinguish the theatre of his being, so much have the aspect of affairs been changed. Poetry, painting and music, have assumed their divinest forms. The exact sciences are brought to a perfection unknown before; literature rolls out its perennial streams, in fertilizing rills; the mechanic arts are rapidly abridging the consumption of labor, and united with science in the construction of the steam engine, has transformed the ocean into a highway, and made neighbors of the most distant nations. On no science has the hand of progress more forcibly and distinctly left its impress, than on medicine and its kindred branches. Its pulses now beat with vigorous health, and its healing miracles are all abroad over the face of the wide earth.

Its infinitely diversified fields of investigation and experiment, have been explored by the most profound, and boldest minds, that ever moved along the path of scientific discovery, and as it now exists in the sunlight of French genius, softened and refined by the profound judgment of the English, and inventive spirit of the American schools, it is confessedly the most perfectly cultivated science known to the world. It is true it has its *quacks* and its *empirics*, its Homœopathy, and its Thomsonianism, but these ex-



creescences which have grown out upon its healthy and vigorous trunk, only show the strength of the system which has driven them to the surface.

In dentistry, that department or branch of the art of healing, which has for the circle of its manipulations and labors, the treatment of diseases of the teeth and mouth, the hand of improvement and progress is equally apparent; and we have only to contrast its present resources and condition with what they were a few years back, to set this fact most lucidly before our minds in all its interesting aspects.

The metaphysician, has declared that the splendid figure of *Venus de Medici*, with its perfect symmetry and beautiful expression, existed in the unshapen marble of the quarry, ere the chisel of the statuary had removed the obstructions that concealed it, or developed its beauties. Thus with dentistry, its perfect laws—its exact and definite proportions—its powers and its capabilities, were all there, but it has required the hand of a *Pygmalion* to remove the rubbish, and display its latent excellence; it stands before us now in the dignity of its high claims, arrayed in the habiliments of science, a potent agent in the removal of many of the ills to which flesh is heir.

The night of its darkness and disgrace, we trust, has passed, and the day now beaming around us, lighted with unnumbered facilities for its cultivation, as a distinct science, will, we doubt not, unite its disciples throughout the length and breadth of the land, in vigorous efforts to develop its capabilities for usefulness.

The obligation resting upon each member of the profession to contribute his individual aid, and influence to the promotion of "a consummation so devoutly to be wished" as that stated above, is not, we humbly conceive, sufficiently considered by our professional brethren, and it has been one principal object in the hasty composition of this essay, to insist upon the *paramount importance of a thorough dental education, and the necessity of union among the profession to support the existing institutions for its dispensation.*

The reasonableness of the first branch of this proposition will be apparent to every considerate mind. A strict sense of moral justice, recognized before written codes were known, has always

demanded proper preparation for any and every pursuit, and the more extensive the responsibility assumed in the pursuit, the more thorough the preparation that is demanded. The merest mechanic does not set up for himself until he has at least obtained a partial insight into the principles of his art; if he does, he becomes the butt of the craft with whom he seeks to associate.

What would be thought of the blacksmith and his capabilities, who, without further preparation, should abandon his *anvil*, and undertake to repair the delicate machinery of a watch. And yet how many hundreds rush into the practice of dentistry, as perfectly inadequate to its responsible duties, as would be the ignorant blacksmith to the repairs and accurate regulation of the chronometer. This rashness too is enhanced by the superior responsibilities of the vocation they assume.

The various organs of the human system are so mysteriously connected by a chain of sympathies and dependencies, that

"Whatever link you strike,  
Teeth or ten-thousandth breaks the chain alike."

The teeth are of the highest importance to health, and constitute a link, that broken or touched too roughly, vibrates through the entire chain, and may lay the foundation of deep and incurable malady, in some distant organ. The preparation, therefore, for the treatment of their diseases, must be laid in an acquaintance with the laws of the system, of which they are a part. Anatomical, physiological, and sound pathological information is indispensable, and it is not the custom of the truly scientific mind to inquire how slight an acquaintance with these subjects *will do*, it will press on to the highest point of perfection, and never rest satisfied until the loftiest summit of excellence is attained.

The various systems and tissues, are more or less affected by every species of dental disease, from the accretions of salivary calculus, to the thrilling, racking, torturing throbs of acute odontalgia, and this too from the period when the teeth are first developed in their deciduous forms, until like the stunted oaks of the sand beach, they appear worn by attrition, few and far between, in the gums of old age and decrepitude. There are also various affections of the gums and membranes of the mouth, some local,

and others the result of constitutional diathesis, which scientific skill can alone successfully treat, and in the management of which is required all the lights of sound judgment and surgical experience. These, and a thousand considerations that might be presented, urge the importance of sound and thorough dental education, for if its capacity to bless and improve mankind, is to be fully tested, it must be done by qualifying its practitioners to assume its responsibilities, and apply its acknowledged rules of practice, extended as they inevitably will be, by sound judgment and patient induction.

These obligations acknowledged, prove the importance of the second branch of the proposition, viz. *The necessity of union among the profession, to support the existing institutions for its dispensation.*

That there are some members of the profession who are in their feelings and conduct, hostile to these institutions, is a painful fact. With less qualifications for practice, than hundreds of their brethren, they have by dint of impudence, or a smuggling process, secured an M. D. to their names, and even while they are earning their bread by the manipulations of our art, are influenced by a sort of ignorant pride, to refuse to hold professional intercourse with any dentist who has not an M. D. to his name; and they seek to destroy the labor of the truly meritorious men of the profession, by speaking lightly of the agencies they have established for education, or else damning them with faint praise. I have been amused at some anecdotes I have heard of some of these *learned gentlemen*, and especially one, who lays claim to great consideration as a dentist, because *he attended in PARIS the lectures of Valpace, on Midwifery.* There are others too, who from indolence, are enemies to the efforts for the diffusion of dental knowledge. These institutions are therefore dependent upon the support of the *intelligent* members of the profession, those who feel an *honest* pride in professional excellence.

The American Society of Dental Surgeons, and the Virginia Society, (and others which may be formed in the several states,) present a means to unite the profession, to bring them together, and inspire a proper zeal in the elevation of their art.

The Journal, as the record of the transactions of all, should

have a place in the library of every practitioner, and by the simple operation of these facilities, a large share of what is required, will be accomplished, but the crowning act, will devolve upon "THE BALTIMORE COLLEGE OF DENTAL SURGEONS." This last institution, presents itself with strong claims upon the profession, as *the only dental college IN THE WORLD!*

It can, and will be liberally supported if the members of the dental profession will generally agree to abandon a course of action—once proper and right in consequence of the condition of the profession, now no longer so—I allude to the practice of keeping students in the office twelve or eighteen months, and then sending them forth to practice, with only *their* certificate of competency. Let them send the young men to the college, and impress upon their minds, that the diploma of an honest and impartial faculty, or board of examiners, is the best *prima facie* evidence of skill and worthiness to practice; not that the parchment *per se*, is a qualification, but that it is evidence of respect for his profession on his part, and that he has made himself familiar with those great principles of science, which rightly practised, will ensure professional distinction.

It is true, there may be instances in which merit may not have the means to obtain these advantages, and must content itself with the office. Whenever this is the case, there are the examining boards of the societies, authorised to grant certificates of competency, and having obtained these, the students should seek by honest and patient industry, the necessary means to enable him to reap the advantages of at least one college course. The determination should be to sustain the college at all hazards, even if the societies are compelled to aid by an appropriation of their funds.

I have witnessed the salutary influence of societies, in bringing those into union who would otherwise, have remained at a perpetual distance, but never more clearly than in the institution of the American and Virginia Societies of Dentistry. The operation of the latter, has particularly fallen under my notice; from comparative strangers, the members have been united as brothers, improper rivalries have given place to noble emulations, a free and full interchange of professional courtesies are had, and a

generous spirit exists to advance each other's interests, and build up each other's reputation. If this were all that is to be gained, we should be amply rewarded for all the toil and labor we are required to expend.

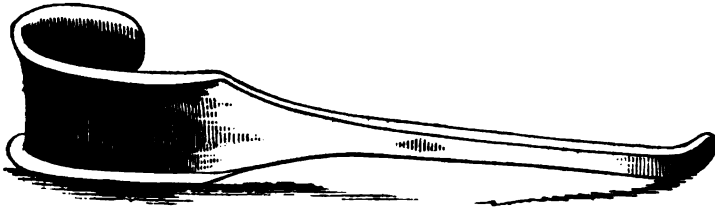
From the hurried statements before us, we conclude it to be the duty of each member of the profession, to cast his influence into the scale of effort, and with generous ambition, contest the palm of excellence with those who have elevated American dentistry in professional knowledge, and artistical skill, high above the efforts of transatlantic professors. The pride of England and of France, must bow to the American galaxy, composed of such men as Hayden, Harris, Parmly, Brown, and others, who have toiled up the steep of professional eminence, and have kindled their fires upon its summit as beacons to the world.

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#### ARTICLE VI.

##### *The Cheek and Lip Protector, (or Retractor.)*

By J. S. GUNNELL, M. D.



THE protector, for opening the mouth and drawing the cheek and lips backwards, protecting them from injury, &c. (invented and used by me ever since the year 1823,) is a silver instrument, (though any other precious metal will answer,) about six or eight inches long, with a handle or stem, and a curve at one or both ends, the curved part about one inch wide. When the curved part is put in the mouth, the inner part of the curve is to be next to the cheek, and the hollow or flexed, or outer part of the curve, next to the front, or forward, and the handle pointing towards or beyond the ear, and backwards; by the instrument being thus applied, the lips and cheeks may be freely drawn backwards, or to one

side, and thereby bring the whole of that side of the mouth in view of the operator, which will enable him to file any of the back teeth, or perform any other operation on the teeth, without difficulty, and the lips and cheek be guarded from injury from the file, by the file passing in the hollow on the outer or back part of the protector, and between the curved edges or flanges of the instrument. The protector serves all other necessary purposes of opening the mouth and protecting the soft parts from injury during the operation of the dentist.

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ARTICLE VII.

*Report of the Onondaga County Medical Society, on "Mineral Paste."* By A. WESTCOTT, M. D. of Syracuse, N. Y.

SYRACUSE, Feb. 1, 1844.

To the New York Editor :—

MY DEAR SIR:—Agreeably to your request, I embrace the earliest opportunity to forward you the report of the committee appointed by the Onondaga County Medical Society, to investigate the merits of "mineral paste," as an article for filling teeth. I transmit, also, some other facts and considerations, relating to this subject, which should you regard of sufficient interest, you may insert in the forthcoming number of the Journal. It may be deemed by those from whose territory this pernicious article has been already banished, by the persevering effort of a few individuals, too late in the day, to write exposes of this species of quackery. I would it were so in this region, but when I assure you that not more than a year since, at least one-half of all the teeth filled in this village, (containing about eight thousand inhabitants,) were filled with *mineral paste*, you may suppose that all the *dental trowels* are not yet gone into disuse. Nor has it been *itinerant* quacks alone, who have presumed to employ it and advocate its virtues.

About one year ago I caused to be published in one of our village papers, an article designed as an expose of this branch of empiricism, I will quote so much of that article, as is not already published in the Dental Journal, it is as follows :

DENTAL QUACKERY—Messrs. Editors—Dear Sirs :—Permit me through your columns to present to the public, the following expose.

Every practice either in medicine or surgery, if it be pernicious in its ultimate results, is the more dangerous to the community, as it is the more alluring, and of the many which are offered to the public, perhaps few so destitute of merit, present more apparent advantages, than that of filling teeth with "*mineral paste*," especially to those who are ignorant of its composition, and tendencies. Indeed, who would not be induced to have their teeth filled when they are made to believe, that the operation may be performed "*without pain*" with little expense, and all this too with "*royal mineral succedaneum*," which, though a paste, when introduced, soon "*becomes as hard as the tooth itself*!" Though this paste has at different times, received different appellations, changing with the fancy or policy of the operator, yet its composition has ever been the same. It uniformly contains as an *essential*, nay, as the *chief* ingredient, *mercury* or quicksilver, the other may be silver, tin or zinc.

From the mercury of this compound when oxydized or corroded, as it always is by the fluids of the mouth, there is formed a substance closely allied to *calomel*, indeed, judging from its *effects*, we might say it more nearly resembled corrosive sublimate which is but another compound of mercury. The above facts will give an easy solution to the phenomena, described in the following letter from Dr. J. Stearns, dated,

POMPEY, Dec. 15, 1842.

DEAR SIR:—Regarding as I do the profession of dentistry as a science, which ought to be ranked among the honorable professions, I therefore feel it my duty for the public good, and the honor of your laudable profession, to expose the vile quackery that is being practised on the community in this section, by an *itinerant* dentist, to the great injury of many individuals, and the success of the practice of dentistry. I will here give a statement of a case or two, which have fallen under my observation. Miss R. S. called me to visit her. I found her with febrile symptoms; her tongue, gums and glands swollen; a free discharge of saliva; a fetid breath, &c. I asked her if she had ever been salivated—she said never, I was positive, however, that she was under the influence of mercury, and then found that two or three weeks before, she had several teeth filled with "*royal mineral succedaneum*." The teeth were very loose; the next day I removed one of the teeth, found it perfectly dead, and the alveolar process affected, which I have since removed, including almost the entire socket of the tooth. I have since been called to Mrs. W. who has been *severely salivated* by the use of the same compound.

Respectfully, yours,

JEHIEL STEARNS.

A. WESTCOTT, M. D.

It is proper here to remark, that the effect as described by Dr. S. in the above letter, is not the same in all cases. I have seen several cases within the last year, nearly as strongly marked, yet perhaps with a majority of those who have had teeth filled with this article, the effect does not amount to salivation in the common acceptation of that term. This much, however, may be safely said, and is of *universal* application, that its tendency in this respect is *always* bad, and in *no* case where any considerable amount of it is used, does it fail to vitiate the secretions of the mouth to a greater or less extent. The *influence* it is capable of exerting, and *time* elapsing before it is rendered perceptible, will depend on the following circumstances,

1st. The susceptibility of the individual to the effects of mercury, it being well known that while some others are badly salivated by comparatively a trivial amount.

2d. The quantity of cement used.

3d. Age and health of the subject.

The remainder was made up of quotations from the different authors who had written on this topic in the Journal and the report of the committee of American Society, July, 1841. No sooner had this article made its appearance than it was construed by the oldest dental practitioner in this village, (Dr. Bliss,) into a personal assault, and that too aimed exclusively at himself! He sought redress by applying to the County Medical Society, of which he *claimed* to be a member, and entreated its interference in his behalf, pledging himself moreover that he would convince them that the cement *he used* was not only efficient in arresting caries, but entirely harmless. The society very reluctantly recognised the subject of complaint as coming within its province, but at length, as the easiest method of disposing of it, appointed a committee of three, to whom the investigation was referred, and who were to report at the next meeting of the society. I was soon after summoned by this committee to appear before them, and answer the arguments, which Dr. B. had pledged himself to give in support of his grand dental catholicon.

At the meeting of the American Society of Dental Surgeons, convened at Baltimore, in July last, I brought this subject up for consideration, asking such action upon it as might be deemed



proper. This request was responded to by the following resolution, which was unanimously passed,

On motion of Dr. Harris, *Resolved*, That this society regards the use of mineral paste in plugging carious teeth as *malpractice*, and that a committee of three be appointed to receive information and facts on that subject to be transmitted to Dr. Westcott of Syracuse, in the state of New York, to be by him laid before the Medical Society of the county of Onondaga, in that state, before which the subject aforesaid is now pending.

This report was duly made, by the able gentleman to whom it was referred, and laid before the committee of the Onondaga Medical Society which, together with the report from that society, I place at your disposal. So much for the history.

On the discussion of this subject, which has been done frequently and efficiently, in the Journal, and elsewhere, the chief arguments against its use have been founded on its pernicious tendency in vitiating the fluids of the mouth, producing salivation, &c. Though *this*, independent of all other objections, is sufficient to condemn its use, there are other considerations which have not been fully weighed. I propose to offer some suggestions under the following heads in their order :

1st. It is uniformly and necessarily inefficient in arresting caries.

2d. It is in every case dangerous.

3d. It is destructive to gold in the mouth either in the form of fillings or plate.

4th. It is never called for.

*First.* Inefficiency, no question is now more clearly settled than that dental caries, is chiefly, if not wholly owing to the chemical action of the acrid fluids upon the calcareous portion of the tooth, and hence the only object gained by any filling, is the protection of the exposed bone from such attack. It follows, therefore, that any attempt failing to accomplish this end, must be futile. Is this end attained by amalgam fillings? I answer promptly, *no*. Before giving any special attention to this subject, that such fillings did not hinder ingress to fluids into the cavity. The first was from observing that the plug when removed, appeared in *all cases* much more thoroughly oxydized on its posterior, than on its anterior surface.

And second, in all cases where the filling had remained any considerable length of time, the tooth was soft behind it, its earthy matter having been absorbed; to put this question to the test, I instituted the following simple experiment:

After preparing a quantity of the amalgam very carefully, I filled with it a strong glass tube, making it as compact as possible, and then suffered it to congeal undisturbed, after which I immersed it in a tincture of red sanders. In a very few hours the colored fluid penetrated entirely around it, absolutely hiding the cement from view. Now if this was the result in the case just described, and that too before any oxydation of its sides had taken place, what must be the result in the tooth, where the advantages for perfectly packing must be much less than in the tube. I may be permitted here to state, that, among the evidences furnished by Dr. B. to the committee upon this subject was a tooth which contained a very large cement filling; this was immersed in the same fluid. On breaking the tooth, the coloring matter was found covering the entire surface of the filling. This point being an important one to settle definitely, both on account of its rendering these fillings inefficient, and also giving a much greater oxydating surface, I was induced to test its specific gravity as corroborating evidence, which alone would have settled clearly this point; upon this subject I need not repeat my own experiments, as we have ample testimony from good authority. In a treatise on chemistry by Wm. Henry, M. D., F. R. S., with additions by Prof. Silliman, in speaking of alloys, he makes the following remarks:

"The specific gravity of an alloy is seldom the mean of its component parts \* \* \* An alloy of *silver with mercury*, though the former metal is specifically lighter than the latter, possesses so much acquired density as to sink in quicksilver." Now, if the above observation be correct, the actual shrinkage in the process of hardening cannot be less than two twenty-fifths.

To make the absurdity apparent of using the compound, with the hope of arresting decay in teeth, no comment is needed.

*Second.* It is, in every case, dangerous.

In order to substantiate this position, it is by no means necessary to prove that this compound does, in every instance, produce

salivation; indeed, so far from this, if it can be shown that a single case has ever occurred from its use, the point is gained.

This conclusion rests upon the fact that *no man*, however skilful, can judge, a priori, either of the natural or acquired susceptibility of an individual, in respect to the effect of mercury upon the system. Hence, whoever places this amalgam in the mouth, does so at the risk of the worst consequences, which are ever liable to result. This, I say, would be true, had there occurred but a single case of the kind. But since we have ample testimony of salivation being a very common result, and, moreover, that a vitiation of the secretions of the mouth a uniform one, the *culpableness* of this practice stands out in bold relief. Next let us lay aside, for a moment, the evidence founded on an observation of the *result*, and examine the properties of this paste, to see whether, by such examination, we should be led to anticipate what observation has shown to be true. To put this to the test, the only conditions necessary to be established are,

1st. That the mercury of the amalgam would become oxydized, and,

2d. That the amount of oxyd formed would, either as oxyd or as salts, by combination with the various acids with which it is liable to be brought in contact in the mouth or stomach, produce salivation.

Under what circumstances, then, is mercury oxydized?

"Mercury is oxydized by agitation in a bottle, half filled with air, and is converted into a black powder."<sup>\*</sup>

Now it is clear that any metal which would be thus affected by simple contact of air, would be far more liable to oxydation in the mouth. For example, tin and silver will retain a *polish* when exposed to *air* and *moisture*; but either of them is very soon corroded in the mouth.

The next question to settle is, whether this susceptibility of oxydation is enhanced by its union with silver as an amalgam? The following testimony, from Dr. Turner, is in point:

"The tendency of metals to unite with oxygen is considerably augmented by being alloyed.† This effect is particularly conspi-

\* Henry's Chemistry, page 40.

† *Alloy* is a generic term, and includes all the various combinations formed by the union of one metal with another, while the amalgam is specific, and applies only to such metallic compounds as have mercury as one of the constituents.

cuous when dense metals are liquified by combination with quick-silver. Lead and tin, for instance, when united with mercury, are soon oxydized by exposure to the atmosphere, and even *gold* and *silver* combine with oxygen, when the amalgams of these metals are agitated with air! The oxydability of one metal in an alloy appears, in some instances, to be increased in consequence of galvanic action. Thus, Mr. Faraday observes, that an alloy of steel with one-hundredth of its weight of platinum, was dissolved with effervescence in diluted sulphuric acid, which was so weak that it scarcely acted on common steel; an effect which he ascribed to the steel in the alloy being rendered positive by the presence of the platinum.\*

If a similar galvanic action results from the union of silver and mercury in mineral paste, the mercury would, of course, bear the relation to the silver as did the steel to the platinum, in the case cited by Mr. Faraday. These two metals, together with the fluids of the mouth, would constitute all the essentials to a galvanic pile. If we add to these considerations the fact, that while "the current formed by the contact of two metals, gives increased effect to the affinity of one of them for some element of the solution, the ability of the other metal to undergo the same change is proportionally diminished," we have at once a clear idea of the changes which occur, and the successive steps in the process. By the galvanic agency exerted between these two metals by the fluids of the mouth, the natural affinity of the amalgam for oxygen is so increased as to make the decomposition comparatively rapid. But the most important conclusion which may be drawn from these premises, is the obvious fact, that the mercury (the most oxydable metal) would undergo much the most important, if not the entire change.† For "when plates of zinc and copper touch each other in dilute acid, the zinc oxydizes *more*, and the copper *less*, rapidly than without contact." On the same principle, precisely, is the silver of this compound protected at the expense of the mercury. It follows, hence, that while the presence of the silver greatly facilitates the oxydation of the mercury, the

\* See Turner's *Elements of Chemistry*, 6th Am. ed., p. 399.

† See Turner, p. 89.

latter metal is principally acted upon, and the result must be a copious formation of a mercurial oxyd, corresponding to the amount shown by observation to be formed.

The only remaining question is as to whether the amount thus formed is capable of affecting the system in the way complained of. Of this, after presenting the following facts and considerations, I leave all to judge, who will lay aside prejudice. The amount of calomel, and other preparations of mercury, required to produce salivation, may be seen from the following quotations from the London Lancet, and the British Foreign Medical Review :

"Very lately, a man who was taking sulphuric acid for epistaxis, was severely salivated by two grains of calomel, in a dose of cathartic pills. *The acids naturally contained in the stomach were the muriatic and acetic, and the mercury contained in two grains of calomel, or a few grains of blue pill, would of course be sufficient to produce the most serious consequences, if changed into the bi-chloride, or corrosive sublimate.*"—DR. SNOW.

The following is the testimony of Mr. Streeter :

"The fact of the action of blue pill being much more powerful at one time than another, might be accounted for by the conserve of roses, with which the mercury was triturated, being occasionally mixed with sulphuric acid, for the purpose of restoring its lost color. Hence, instead of the simple oxyd, the sulphate of mercury was producing its effect on the patient. He had no doubt, however, that some constitutions were remarkably susceptible of the influence of mercury in its mildest forms. He had seen severe salivation produced by the administration of nine grains of blue pill, although it had been given in only *one grain doses*, three *times* a day, and its effects watched with the greatest care."\*

We give the following quotation from Dr. Law, in corroboration of the above :

"We directed *one* grain of calomel to be mixed up with a sufficient quantity of extract of gentian to make a mass, to be divided into twelve pills, one of which was to be taken every hour. We found, in some cases, salivation to be produced by twenty-four of these pills, or two grains of calomel, and seldom were forty-eight pills, or four grains, required to produce this effect. \* \* \* \* We exhibited the blue pill in the same way, and found the mouth to

\* London Lancet, Jan. 18, 1840, p. 625.

become sore from six grains.† \* \* \* We have found one drachm in every night sufficient to produce salivation."‡

Dr. Law accounts for salivation by such minute doses of mercury, on the supposition that a succession of impressions is thus kept up by the frequency of their administration. Nothing is more clear than that a very small quantity of mercury is capable of producing salivation, much less, I propose to show, than would result from a single cement filling.

I have one of these fillings in my possession which weighs sixty-three grains. Now this amount of amalgam would be sufficient to produce from the mercury it contains, thirty-seven grains of calomel, and about thirty-eight and one-half grains of corrosive sublimate. On the supposition that the *whole* of this was administered as calomel; in the way described above, it would be more than sufficient to salivate eighteen persons!

What are the real facts in the case? It has been shown that by the contraction of the mass in the act of congelation oxydizing fluids, have free access to the *entire* surface of the filling. A large oxydating surface, is hence constantly exposed to the perpetual action of these fluids. This oxyd, while it remains such, would get into the system only from the outer surface of the filling, and hence it accumulates, and would continue to do so till either some extrinsic acid, or the acid of the saliva, which frequently occurs under peculiar states of the system, unite with this oxyd, and convert the whole into a salt of mercury. It is a fact, moreover, that the mildest salt of mercury, which could be formed under any circumstances, is calomel, and inasmuch as the principal acids, prevailing both in the fluids of the stomach, and mouth are muriatic, with a small quantity of acetic, the presumption is, that corrosive sublimate, would be quite as likely to be the result, as calomel. Not only so, the mode of administration in respect to succession of doses, corresponds almost exactly with that above pointed out, in order to produce salivation with the least possible quantity of mercury. But while it is true, that in most instances, the mercurial action would thus be got up only at in-

† It will be recollected that the blue pill is essentially the same as the oxyd formed in the mouth before acted upon by acids.

‡ British and Foreign Review, April, 1840, p. 582.

tervals, alternating with changes of health, and natural fluids of the mouth, it is also true, that in many mouths, this oxyd of mercury, would be constantly changing into salts, from the uniform acidity of the saliva, and hence such persons would be constantly receiving the impressions from the oxyd of the entire surface of all the fillings in the teeth, and in *no case* would a person be freed from the amount of constant effect, which would follow from that portion of oxyd which accumulated on the outer surface of the filling. From the above facts and considerations, we make the following deductions :

1st. That every person wearing in the teeth any considerable quantity of this cement, is *liable* to salivation, from the accumulation of the oxyd shown above to take place.

2d. Every person is subject to so much of the *constant* effects, as would accrue from all the oxyd formed on the outer surface of these fillings, and which would be easily carried into the stomach.

3d. Those persons whose saliva is very generally more or less acid, would be subject to the *constant* impressions from the *entire oxyd* formed on the *whole* surface. In either of the last two cases, the effect would be sufficient to keep up an unhealthy action of the secretions of the mouth, if it did not amount to salivation.

4th. The constant oxydation and solution of the surfaces of these fillings, renders them less and less perfect, in respect to preserving the tooth, by giving more free access to those fluids which are the chief sources of decay.

*Third.* This amalgam is destructive to gold fillings and plate. The strong affinity of gold for mercury, renders this amalgam destructive to gold fillings or plate. I have seen in several instances the teeth which were clasped to secure the plate, filled with mercurial paste, and in each instance the clasp was literally eaten off at this point. To demonstrate this effect, we need only rub a piece of gold with the amalgam, when the surface will immediately become white to the extent that the amalgam of gold is formed. This amalgam like that of silver is oxydable and easily removed ; gold plugs and plate are not only subject to this destructive process, from actual contact of the amalgam in its primitive form, but several salts formed from the oxydation of these

cement fillings, and which are held in solution by the saliva, are also destructive to gold.

The fourth position we took in relation to this amalgam, was that its use is never called for. Though this position rests mainly on the ground, both of its inefficiency and hurtful tendency, yet were each of these qualities susceptible of remedy, it might easily be dispensed with. In substantiating this ground, we will briefly analyze the claims to confidence, which are set forth by its advocates, and which are offered as excuses for using it, the principal are the following :

1st. "Teeth so frail as cannot be filled with gold, may be filled with this amalgam."

2d. "A filling of this paste may be made to remain permanently, where one of gold could not."

3d. "The operation causes little or no pain," and

4th. "It is less expensive to the patient."

We remark in relation to the above reasons for employing "metallic cement," that they are so plausible without a careful examination, and such an one as few are enabled to give this subject, that its allurements are so strong, that we by no means wonder that so many unsuspecting people, have consented to have their teeth ruined with this worse than quack remedy, which unexamined, promised fair to shield them from one of the greatest ills which, at least *bone*, "is heir to."

It may be remarked also, that its claim is enhanced, not unfrequently by the former standing of those who recommend it; were its use confined to *itinerant* quacks, the case would be different, but when we find for example, a man who claims to have practised dentistry in the same village for fifteen years, and that he has read and practised medicine for several years; when we find such a man, though stooping to this low degree of empiricism, claiming that he has *successfully* filled within the last twenty-two months, at least three hundred teeth with this mercurial paste, we need not be astonished at the number who would be thus inclined to try its virtues. But we will examine each of the above asserted virtues of this paste.

1st. What is the fact in relation to saving by its use, these "frail teeth" referred to, or inasmuch as it has been clearly shown



that the paste is incapable of saving *any* tooth, we may inquire more properly whether gold cannot be used in all teeth, capable under any circumstances of being successfully filled. If we are allowed to introduce testimony on this subject, we have it amply given in a resolution of the American Society of Dental Surgeons, in a convention held at Philadelphia, August, 1841. In this resolution, unanimously passed by said society, it is declared, that "there is no tooth in which caries in it may be arrested, and the organ rendered serviceable by being filled, in which gold cannot be employed."

It is well understood by all who are conversant with dental operations, that caries frequently occurs where it is impossible to retain the *entire shape* of the tooth, but I would inquire, what would be gained by either making up for *lost* substance, with an article which can serve only to *disfigure*, or by undertaking to fill *beneath* a portion of enamel, which would be fractured with the slightest pressure, with a material entirely incapable of preserving such delicate portion, or indeed any other part of the tooth. The fact is, that almost any tooth in which the nerve is not actually exposed, may be filled by a sufficient loss of substance, properly to shape the cavity. Under what circumstances then is it objectionable to sacrifice *any* of the substance of a tooth? The *necessary* loss would be almost exclusively confined to front teeth, and here the question again arises, what can be gained by filling under a portion of transparent frail enamel, with a substance which by its immediate oxydation and consequent discoloration, can only serve to disfigure, infinitely more than the actual loss of that portion of the teeth—to say nothing of the inefficiency or evil tendency of such fillings. On the supposition that this paste was not objectionable in itself considered, its use would very rarely be indicated for *such* reasons, in the hand of a skilful operator, who uses instruments of sufficient delicacy, and foil of a proper pliancy.

I venture to assert that an exception to the rule, that gold may be *generally* used, would not occur in one case of a thousand, and in *this* case, *paste* could not be made to stay. Query—would three hundred such cases occur in twenty-two months to a person in a very sparse practice?

. It is asserted, 2dly, that cement can be made to stay, where gold could not. This assertion shaped a little differently, is doubtless literally true. In other words it is *doubtless* true, that *those who employ cement* could make it more permanent, at least in many instances, than *they could*, a gold filling. Were I under the necessity of charging my patients not to eat molasses candy, I certainly would resort to the use of cement, or abandon my profession. But the question is not whether gold would remain in the very cavity which some *tooth mason* had prepared for his *cement mortar*, but whether in any case, the cavity in question, might not, if skilfully prepared, be filled successfully with gold. This question is virtually answered by the American Society, in the resolution above quoted, where it is declared in substance, that *gold may be employed* in all those cases where it would be serviceable to fill a tooth, and so far as my own opinion can serve to substantiate this view of the subject, I give it without qualification, in concurrence with the society, as expressed in said resolution.

It is a very common impression by those who are unacquainted with the pathology of caries, that while a filling remains, the tooth is safe, but all who are at all conversant with this subject, know that this is far from being necessarily the case. I have often been called upon to extract a tooth, having in the very cavity which was the origin of the difficulty, a *gold* plug, which from the imperfect manner in which the operation was performed, had not arrested the caries, but which had been retained there, in consequence of the aperture through which it was introduced, being much smaller than the cavity within. This remark is particularly applicable to cavities filled with cement. That these fillings frequently remain till the mass by oxydation becomes much lessened, or till the tooth requires extraction from the ill effect of the paste, or from exposure of the nerve, I freely grant. The difficulty often is in removing them, and indeed this is the very thing complained of. Did they easily escape, it would break the charm, and fewer evils would result from this species of quackery.

3d. It is asserted, that the operation of filling with this paste, causes "little or no pain." In respect to this point, it is quite as well known to *patients*, as the operator, that the pain of the ope-

ration, is almost exclusively confined to the preparation of the cavity for receiving the filling, and if it is essential, as it certainly is, to remove entirely the carious portion, when the cavity is to be filled with *gold*, I would inquire, what makes it less essential, when it is to be filled with paste—and if the care in this respect, be the same in both cases, how can the operation be less painful? The only conclusion which can be drawn in relation to those operators who verify this promise to their patients, is, that *they do not remove the diseased portion of bone*, which no one denies to be essential. Few men have ever made a greater figure with mineral paste, than the famous or "infamous" Mons. Mallan, and in relation to him, *it is a fact*, that he caused *no pain* in the operation, and the secret lay behind the filling, which on being removed, the mystery was perfectly apparent.

It was, that not even the *foreign matter*, was removed. In a well attested case it was found, that on removing several of these fillings, immediately after they had been inserted, the cavities were partially filled with "pound cake," which had been purposely lodged there, but a few minutes before.

In relation to the *cheapness* of such fillings to those wearing them, I apprehend that little need be said, after demonstrating both their inefficiency and hurtful tendency. The idea of paying half the amount of a good article, for one much worse than nothing, is a policy easily understood. But this by no means is the extent of the evil. The money paid for the operation is not merely lost, but the *teeth* are thus sacrificed while the patient is feeling that they are being saved. Add to this the danger, and perhaps the actual occurrence of salivation, a siege of the tooth-ache, and finally the extraction and loss of the tooth, and we have a fair representation of the cheapness of a *very dear* operation.

Having now analyzed the qualities which it is claimed by its advocates to possess, I beg leave to offer an opinion, at least, upon the *real* inducements, or rather *temptations*, in all cases where the operator is not *culpably ignorant* of its real character, to employing this compound for stopping carious teeth. The principal are the following: 1st. It requires much less skill. 2d. It requires much less time, hard labor, and perplexity. 3d. The expense to the dentist is comparatively trifling.

That no special skill is required in using this article, hardly needs a single comment to prove. The fact that it becomes hard would render it evident, on the least reflection, that it would not be easily removed, in any case where the inner portion of the cavity was much larger than the outer. If this was not true of the entire cavity, if there were only two opposite projecting points, the object might be gained for a time. But, as has already been suggested, though it might remain, the tooth would not be benefited unless it excluded from the cavity the fluids of the mouth; and the skill required to perform the operation would be far less than that exercised by the mason in making mortar adhere to an upper ceiling.

In respect to the comparative *time* required, we will let one of the chiefs of this tribe of operators speak for himself, in his own language, as is sworn to by several respectable witnesses:—"I can fill a tooth in a few seconds, sir, without giving the least pain. I filled thirteen teeth, yesterday, for a young gentleman of this city, a solicitor in chancery, a very liberal young gentleman. We can put in this composition of ours in *less than no time*; I filled those thirteen teeth yesterday in less than five minutes."

Here Monsieur Mallan asserts that he filled thirteen teeth in less than five minutes, whereas it not unfrequently happens that the most skilful operators spend *an entire day on a single gold filling*, meeting, at every turn, such difficulties and perplexities as can be appreciated only by those who have met and contended with similar ones.

In relation to comparative expense to the *dentist*, the sum is very easily stated. On the supposition that this cement contains sixty-four parts of mercury to thirty-six of silver, and estimating the mercury at one dollar per pound, and the silver at twelve dollars per pound, an ounce of this cement would cost forty-one cents, whereas an ounce of gold cost not less than thirty dollars, or more than seventy-three times as much as the same weight of mineral paste. To say the least, this would be a convenient saving, could it be made safely.

Having now briefly reviewed both the real and alleged properties of this paste, I subjoin the report of the committee appointed by the Onondaga County Medical Society, in June last. The

circumstances giving rise to this committee, have been sufficiently detailed in the former part of this article; it will be borne in mind that it was appointed at Dr. B's earnest solicitation.

The report is as follows, viz.

The Committee to whom was assigned the duty of reporting to this Society upon the utility and safety of the royal succedaneum, in reference to its use in filling decayed teeth,

Observe—that there is a difficulty appertaining to the investigation of the subject, arising from the fact that the more intricate dental operations have been but in a limited degree the subjects of medical investigation.

Since dental surgery has been professed as a distinct branch of the healing art, there has been a disposition, (and we think a commendable one,) on the part of the medical profession, to confide both the investigation of the principles, as well as the practice of dentistry, to those who make that study and practice their exclusive object. And the Committee would have been quite willing that the diseases incident *to*, and arising *from*, dental practice, should also have been confided to the professors of the dental art, not doubting that they are fully competent to the task, although, from the acknowledged modesty and professional diffidence which characterize *most* of that profession, they might disclaim the possession of the requisite skill. But as the subject has been brought formally before the Medical Society, we observe, that cases have come to our knowledge, through one of the members of this Society, of serious injury resulting to a number of individuals from the use of the royal succedaneum. We have also learned, from other sources, that in many instances bad effects have been produced, and, in some cases, that not only severe and distressing *local* disease has ensued from the use of the mineral paste, but the *lives* of *patients* have been *endangered*. On the other hand, we have the testimony of many persons who have had their teeth filled with the mineral paste, without experiencing any unpleasant effects; on the contrary, the ease, facility, and cheapness of the operation, and the fact that in these instances it has *apparently* answered all the purposes which could have been attained by the use of any other material, and has been used when, in the opinion of *some dentists*, it would have been difficult,

perhaps impracticable, to have used gold or tin foil,—all *seems* to imply some value in the practice. The testimony of an experienced dentist,\* upon *whose representation of facts* the Committee can rely, is, that within the last two years he has filled about three hundred teeth with the mineral paste, and that, to his knowledge, in no case has the specific effects of mercury been developed. To this statement it has been objected, that in a few instances the effects of mercury upon the mouth, from the use of the mineral paste, have been noticed in this village.

The Committee have no means of ascertaining the proportion of cases in which the mineral paste has produced the specific effects of mercury. As regards the utility of the paste, as a filling for carious teeth, the Committee have examined some cases in which the cavity *seemed* to be accurately filled, some months after the operation. To test this matter, however, by accurate experiment, a small vial was accurately filled with the amalgam, from which the free mercury had been pressed out by the application of great force. The vial was plunged into a colored liquid; in a few hours the fluid was found to have entered the vial by the sides of the amalgam, proving conclusively that the amalgam diminishes in volume in the process of solidification.

That form of the paste which contains the smallest proportion of mercury becomes the hardest. It would *apparently* then, be the object of the dentist to diminish the quantity of mercury to the lowest point necessary to form the amalgam, so that, in the hands of the operator who would give to the article such proportions as would make the most eligible compound for use, the royal succedaneum would be less likely to produce injurious effects.

But it should be observed that the mercury and silver unite in but one proportion, and that any excess of mercury in the compound is in a free state; that when the mixture is subjected to the greatest degree of pressure to remove the free mercury, the amalgam then contains a proportion of sixty-four of mercury to thirty-six of silver.

To account for the activity of so small a portion of mercury, as the ordinary filling of a tooth would contain, the Committee refer to the admitted chemical principle, that "the tendency of

\* Dr. S. Bliss.

metals to oxydation is *much* increased by being alloyed." We find this fact so strongly stated and exemplified, by the standard chemical authorities, that the question has arisen in the mind of the committee, whether the presence of an equal quantity of free mercury, would probably be *more pernicious*, than the presence of the amalgam of mercury and silver. On this head the Committee also refer to recent published statements of interesting experiments, in proof of the occasional highly acid state of the saliva, not only in active disease, but in some instances, where there are but slight apparent deviations from health.

If it were admitted that the bad effects of the amalgam have resulted from an undue proportion of mercury, reasoning from the effects of even minute doses of mercury, internally administered, upon some constitutions of peculiar susceptibility to its action, the committee observe, that if the mineral paste containing the largest proportion of mercury, has produced ptyalism, in numerous instances, that it cannot be so combined as not to produce its specific effects in some.

The occasional evil effects of mercury, even when clearly indicated, and used with care and discrimination, have been so often noticed and described by medical practitioners, that the Committee need not enlarge on this point. In most cases, however, in which the local effects of mercury are injurious, some important benefit has been obtained to compensate the patient for his sufferings. If a patient were laboring under hepatitis or syphilis, he would have no good grounds of complaint, if his general malady were relieved, though the local effects of the remedy were severe.

It has been urged, that if the occasional bad effects of mercury used in dentistry, are to preclude its use, by parity of reasoning, it should also preclude its use by the practitioner in all cases.

But the difference in the cases arises, not so much from the *nature and effects* of the article in question, as from the relative importance of the object to be attained. To incur the risk of ptyalism for the preservation of a carious tooth, would be one thing—to take the same risk for the probable preservation of life, or for the removal of a serious malady, would be quite another. The first would be a matter of taste, or of probable convenience, the latter would involve the most important consequences.

The Committee enter into no discussion of the *modus operandi* of mercury in these cases. It would, however, be an interesting subject of inquiry and experiment, whether its peculiar effects are produced by the absorption and *direct* application of the mercurial oxyd to the parts involved, or whether it does pass into the *general circulation*, before its local effects can be evolved. Whether it is possible under any circumstances, and by any management to produce ptyalism, independent of the general circulation.

The Committee have thus endeavored to place before the Medical Society the leading facts in the case, and have added such reflections as naturally arise from the subject. That the mineral paste has produced, in many instances, the peculiar effects of mercury, though in different degrees of intensity, in some slight, in others severe and alarming, there can be no doubt. The Committee believe that the proportion of such cases is small compared with the whole number operated upon, but that no care in the *combination* or *use* of the paste will prevent its occasional bad effects. In view, however, of the *apparently* favorable cases, the question arises in regard to the *probable effects* upon some constitutions from the gradual absorption of the oxydized mercury, even when no *palpable* local effects are induced.

But we leave these points to the consideration of the society, referring the whole subject to it, for such action as it may choose to take, and for the expression of such an opinion of the merits or demerits of the mineral paste, as its regard to the interests of medical science, and its duty to the public may demand.

P. C. SAMPSON,  
Chairman of Committee.

I certify, that at the semi-annual meeting of the Onondaga County Medical Society, held on the 30th January, 1844, at the Temperance House, in the village of Syracuse, the above report was read and unanimously accepted by the Society.

N. R. TEFFT,  
Secretary.

Few comments are needed upon any portion of this report, and indeed none can be added to strengthen its condemnation of the very article it was expected to eulogize. Unfortunately for



mineral paste and its advocates, this committee\* was composed of men who early learned to despise quackery, in whatever form it makes its appearance—whose love for truth and science, led them to investigate, and when conclusions were fairly arrived at, they were not by the naked assertion of a single man, though old in years, to be deterred from giving the whole truth. This report will have a most salutary influence on the community whence it originated, and will do honor to the able gentlemen by whom it was made. Although as I have stated, nothing can be added to give it strength, it contains several suggestions, which have not been fully discussed, and to which I propose to give some further notice.

The first is in relation to the testimony of individuals. The report under this head, reads as follows, viz. "On the other hand we have the testimony of many persons who have had their teeth filled with the mercurial paste, without experiencing any unpleasant effects."

In respect to such testimony, we remark, that it is very rarely to be trusted, especially when the effect is gradual, and the individual is not put to extreme inconvenience, or positive suffering; since this subject has been under discussion, I have met in several instances with persons who complained of an extraordinary flow of saliva, both by day and by night, but who could hardly be made to believe it was caused by several large amalgam fillings. And even before this effect is produced, this mercurial action is pervading the system, only waiting for some developing circumstances to bring out its marked and specific character, in the form of salivation. How often do we meet with the most extensive disease in the mouth, such as inflamed and ulcerated gums, alveolar abscesses, teeth loosened by tartar, &c., while the persons positively declare, that their teeth and gums are entirely well, and to prove conclusively their position, they assert that "they never ache." Actual pain is made a standard of *disease*, and any thing short of this, I may say, is *generally* regarded a proof of health.

Now salivation considered as a disease, it may be remarked,

\* P. C. Sampson, M. D.; M. M. White, M. D.; E. T. Richardson, M. D., Committee.

unless very intense, never produces pain. It may, therefore, be safely assumed that the specific effects of mercury may not only be carried to the extent of vitiating the fluids of the mouth, but actual salivation might occur without the individual suspecting, in the least, the origin of the difficulty.

Is any other proof demanded of the uncertainty of such testimony, either in respect to disease or remedies, we may refer to the massive testimony of marvellous cures by quack nostrums, with which our newspapers are daily loaded—whereas the truth is, that very few who thus testify, know any thing either as to the nature of the disease treated, or the remedy given, or indeed what medicine they had been taking.

The next point is in relation to the testimony of "the dentist" who uses this paste.

The following is the language of the report :

"The testimony of an experienced dentist,\* upon whose representation of facts, the committee can rely, is, that within the last two years, he has filled about three-hundred teeth with the mercurial paste, and that to his knowledge, in no case has the specific effects of mercury been produced."

In respect to such testimony, it would seem, unexplained, somewhat surprising. For a time this astonishing result was accounted for by this "experienced dentist," by saying, "he pressed out all the free mercury through a rag."

But since it has been clearly shown that the mercury actually combined in the silver, was *more* likely to become oxydized than *free* mercury, I have not heard his amendment to this *ragged* explanation. Without spending time in conjecturing what would be the next turn, I will offer what, in case "his representation of facts *can* be relied on," must be the real solution of the mystery. We will suppose these cement patients divided into two classes, the one embracing all on whom the specific action of mercury had not amounted to severe ptyalism, and the other embracing those whose suffering had compelled them to seek relief. The former class, as has been shown, not recognising any special difficulty, would apply to no one for consultation or advice, and this class I freely admit, would embrace much the greater proportion.

But what of the others—

\* Dr. Bliss.

That fox which had lost in a trap, an important member, would by no means be distinguished for his cunning, should he apply for relief to him who set and sprung the trap. Nor would a salivated patient sooner apply to a dentist, *however "experienced"* he might be, to be restored from a disease which his culpable *ignorance* or neglect had brought upon him. Hence, *if at all*, he could say of a truth, that in no instance had any evil result followed *such* operations. That many of the cases which did not come to this "experienced dentist's" *knowledge*, came to the knowledge of this *committee* is certain, and formed no small item in bringing them to the conclusions found in this report.

The fact that this paste, by whomsoever made, unless it contain one of the ingredients in a free state, must be of the same composition, though an important one, has perhaps been sufficiently commented upon by the Committee. The attractions of this amalgam based on its *apparent* success, "the ease, facility and cheapness" have been also fully discussed in the remarks preceding this report.

I shall only add to the foregoing facts and consideration, the report of the Committee appointed by the American Society of Dental Surgeons at their last meeting, to collect facts to lay before the Medical Committee of Onondaga County.

This report is as follows:

The Committee appointed by the American Society of Dental Surgeons, at its Annual Meeting in Baltimore, July, 1843, to which was referred the subject of metallic paste, or amalgam, used by certain individuals for stopping carious teeth, begs leave to report. That at the aforesaid meeting of the above named society, it was, "*Unanimously Resolved*, That this society regards the use of mineral pastes, as stoppings for carious teeth, as malpractice."

The Committee, furthermore, refers to a circular issued in May, 1841, in the city of New York, relating to the identity of the material employed by a certain Mons. Mallan, and that used a few years before by the notorious Messrs. Crawcour, in which it is proved by the unquestionable testimony of Dr. Chilton, a distinguished chemist of the aforesaid city, that mercury and silver were the ingredients of the paste used by the persons above nam-

ed, by which so many fine teeth were wholly and irretrievably destroyed.

It may not be irrelevant to state, that such was the indignation of the public sentiment, in regard to the use of this amalgam by the Crawcours, that the officers of justice pursued the ship in which they had precipitately embarked for Europe, as far as the Hook, in a steamboat chartered for the purpose, with the intention of bringing them to the punishment which their flagrant imposture so richly deserved, but the captain of the ship did not find it convenient to permit the officers to go on board, and thus the renegades succeeded in making their escape.

In regard to the departure of Mons. Mallan, after a short visit to our country, the Committee asks leave to refer to a notice of that fact given in the first number of the fourth volume of the American Journal and Library of Dental Science, issued Sept. 1843.

*"The last Importation of Trans-atlantic Quackery re-shipped for England, with the usual allowance of 'drawback.'"*

"The famous, or more properly the *infamous*, Mons. Mallan, of mineral paste notoriety, the worthy successor of the Messieurs Crawcour, has recently taken French leave of his tailor, his shoemaker, his upholsterer, his printers, 'et id omne genus,' who have allowed him to run up bills without footing them, during the past two years, in the city of New York. The profession throughout the country are indebted to some of their enterprising brethren of that city, for having made such an *expose* of the mal-practices of this consummate quack, as to induce the good people of New York to be on their guard in relation to employing a foreign mountebank, instead of the honorable members of the dental profession who are located among them.

"It will be remembered by most of our subscribers, that a circular was forwarded to them about two years ago, containing extracts from English journals, together with affidavits taken in New York, with respect to the practices and professions of the individual named above. Such was the effect of this circular as to prevent the empirical vagabond from gaining a footing in any other place than New York, where he was reduced to the alternative of either flight or starvation.

"Such is the salutary effect of associated effort in suppressing imposition in dental practice. We hope our brethren, in all parts of the country, will exhibit equal enterprise, in every similar case; to the end that the empirics of the old world may learn to expect no success in the new. The editors of some of the London

journals deserve our thanks for warning the American public of the approach of the above named charlatan to our shores; and we hereby reciprocate the favor, by informing them that he has lately returned to their island."

The Committee states, furthermore, that according to the best knowledge and belief of all the honorable members of the profession with whom the individuals composing this Committee have conversed, the mineral paste, in use among the quacks and charlatans of the dental profession in the United States and Great Britain, is this identical amalgam of mercury and silver, which can be inserted firmly in a tooth by mere pretenders, who find it impossible to make a permanent stopping with a proper material.

Among a host of examples of the destructive properties of this amalgam, when inserted in human teeth, which have come to the knowledge of every dentist in extensive practice, the Committee asks leave to detail the following case, which occurred in the practice of the chairman of this Committee, on the 30th ult., at No. 1 Bond street, in the city of New York:

A lady of Belleville, in the state of New Jersey, called on Dr. E. Parmly, on the day above-named, in great distress, from disease in the first right molar tooth of the upper jaw. On examining the mouth, he found the gum around the aforesaid tooth to be of a dark hue, and nearly or quite destitute of healthy circulation. The tooth itself was also dark and necrose, and evidently demanding immediate extraction. Before removing the tooth the operator passed a probe along the side of the tooth, completely into the cavity of the antrum maxillare. When the tooth was extracted, profuse hæmorrhage succeeded, and considerable portions of ash-colored bone adhered slightly to the fangs. Six or eight other pieces of bone, about the size of small peas, were afterwards removed from the cavity of the sinus. The cavity was filled with blood, which made its escape through the nostrils, down the throat, and out of the mouth of the patient. The lady informed Mr. Parmly that she had been often nearly strangled at night by purulent matter, which made its escape from the antrum through the nostrils into the fauces, larynx, and trachea. The operator found so large an opening into the antrum, after removing the diseased tooth and decomposed bone, that he could easily pass his little finger quite up to the sub-orbital parietes of the cavity. This

tooth had been filled with a very large plug of mercury and silver, which was unquestionably the cause of the deplorable effects already described.

The Committee therefore expresses the unqualified opinion, that mineral paste is wholly unsuitable for the purpose of filling the cavities of carious teeth, and should never be employed for that purpose. In confirmation of the opinion which the Committee have thus expressed, they subjoin the following certificates.

ELEAZER PARMLY,  
SOLYMAN BROWN,  
JOSEPH H. FOSTER, M. D.

On the twentieth day of July, 1843, I was called to visit a lady who was suffering from a tooth filled with the mineral amalgam. This lady had been sent to my office nearly a fortnight previous, by her physician, to have the same tooth removed. Not remembering the number, she stopped at the first door in the place, and inquired of a gentleman standing there if he knew the number of my house. He could not or would not give her the desired information, but observing her face to be bandaged, inquired what operation she intended to have performed. She told him, extraction. He then remarked, "there is no necessity, madam, for you to lose your tooth, come into my office, and I will fill it for you." She accordingly consented, and underwent the operation, and paid him his fee of five dollars. When it was finished, she told him that the tooth was aching more violently than before. "Give yourself no uneasiness, madam, the pain will be of short duration, and you will then have no more suffering, and your tooth will be useful to you for a long time." That ignorant, foreign mountebank and charlatan, Mons. Mallan, who so effectually succeeded in imposing upon the credulity of many of our citizens, is the individual to whom I am giving full credit for the operation, and the consequent effects of it in this case.

For a week succeeding the operation, this patient suffered the most acute agony, passing sleepless nights, and obtaining only occasional relief by the use of opiates, and declining to send for her physician because she did not like to inform him that she had acted contrary to his directions. On examination, I found the periosteum of the inferior maxillary bone much inflamed, the adjacent soft parts tumefied, very hard, and acutely sensitive to the touch. The interior of the mouth was in an equally inflamed state, and the patient had been for several days, and was still, severely salivated. With some difficulty, I succeeded in extracting the tooth, the second molaris; on the side next to the dens

sapientiae, I found a large cavity, and in and around it, a filling which I knew to be the same composition which Dr. Chilton had analyzed, as before used by Mons. Mallan, viz. a compound of mercury and silver. Removing the filling, I found the chamber of the tooth and the interior of the fangs very dark colored, and the confined matter highly offensive. The cavity had apparently been filled without any attempt to remove the diseased portion. An excavating instrument had not been used, but the filling was pressed into the cavity upon the exposed nerve, and not only into the cavity, but into the natural space between the teeth, and under the gums, and from being thus in direct contact with the mucous membrane of the mouth, it had acted upon the glandular system so as to produce active ptyalism. Dr. Wooster informed me that this lady had previously enjoyed good health, and that he had not administered any mercurial medicines.

I could cite many other cases which have come under my own observation, in which this article, called by as many assumed names as there are different operators who use it, has been productive of much serious injury; one such case, however, is sufficient to convince any one who may witness it, what I have been compelled to believe, and now assert, viz. That no individual in the profession, who places any value upon his own reputation, or who expects or deserves to retain the confidence which those who seek his services repose in him, will incur the risk of using this mineral amalgam. Those who do use it are not likely to know the extent of the injury which they do, for when serious suffering results, patients are not apt to return to the cause of all their trouble to seek relief, but go elsewhere for advice.

JOSEPH H. FOSTER, M. D.

I hereby certify, that the facts, as stated by Dr. Foster, in relation to the above case, are correct; that I was the constant medical attendant of the lady referred to, and know her to have been a comparatively strong and healthy person previous to this event; that I had had no necessity for, and had not administered any mercurial medicine previous to the extraction of the tooth, and that on my first visit after the operation by Mons. Mallan, I found her glandular system had been affected so as to cause active mercurial salivation. I continued my attendance upon her for four months afterwards, during the whole of which time she was unable to attend to her family duties. The swelling of the face could not be reduced by any remedies, and continued the cause of so much acute suffering, that a fever ensued, and very active treatment was resorted to at one period to prevent a threatened inflammation of the brain. Exfoliation of the inferior maxillary bone I was constantly apprehensive of, until I became convinced that the case had assumed the form of osteo sarcoma.

At the end of four months, when this lady left me to go to the south, her face had not resumed its proportions, nor could I perceive any approximation to a change, and her pain still continued.

I have no doubt that all her sufferings are justly attributable to the mineral amalgam so much used in filling teeth, and which, I am convinced, is not only an improper, but a highly dangerous compound.

JOSEPH WOOSTER, M. D.

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#### ARTICLE VIII.

*The Dental Surgeon Defined.* By C. T. CUSHMAN, Columbus, Ga.

IT has been held a popular opinion, that a "somer-set" from the ordinary walks of life into the dental profession, is one of the easiest turns that can be made; and with this idea, a great many are daily risking their necks by attempting the sudden transformation. There have been instances of individuals, with no qualifications by study, nor the teachings of experience, and even those who scarcely possessed sufficient common school education to enable them to write their own names, *graduating* at a *coup de main*, and, their "practice" in two or three years, has enabled them to *retire* into the luxuries of private life! Such cases, or similar, have occurred all over the country, and tended to awaken the aspirations of their brother ostlers, corn-cutters, and mule-drovers, to follow in the same flight. But, the people have learned by experience—and they will have no other teacher—to beware of "land-sharks;" they have, the most of them, by the aid of these *parvenu* professionals, "cut their eye-teeth," and learned to examine the pretensions of those who pretend to examine them. They have found that the bungling manipulations of those whose only physiological knowledge, and mechanical skill, consist in *intuitive perception*,\* are of no benefit; but, that often, as to be reasonably foreseen, they end in disfiguring forever those valuable appendages, so essential to the beauty and dignity of the countenance, and to the general health of the body—the teeth. They are thus placed beyond the power of art to restore, and no tears of regret can avail for such rashness.

\* The reader has doubtless heard of "*Natural Bone-Setters*," and the like. I could refer to one of the same *genus* who professes to be a "*Natural Dentist*."



But it must not be inferred from the devastations of these individuals, from the fact that they have employed mineral acids, and barbarous usage upon these delicate organs—that the science of dental surgery is a chimera, and productive of no good—such a denunciation might be with no more injustice, applied to that of medicine, because of its flagrant abuses by unprincipled pretenders. It is a positive and demonstrative science; its remedies are not problematical in their effects, but determined, and visibly under control. As promulgated at the present day, especially by the American Society of Dental Surgeons, the only body of enlightened and scientific men in the history of the world, who have recognized it as a distinct and important one, of vital interest to the human family, it is founded upon everlasting truth.

• Among all nations of the world are found the same natural diseases and defects of the dental organization, which enlightenment here has now learned to remedy, and the progress of art to overcome.

There are but few greater benefactors to humanity, than the learned and skilful dentist. For no person, perhaps, ever attained the age of twenty-five years, who had not need of his services. And, the amount of pain and of suffering, of mental anguish and lost comforts, of most people in after life, and in old age, resulting from diseases and loss of *the teeth*, is overwhelming to the contemplation. But there is a "Balm in Gilead." If he be seasonably employed, and frequently consulted, from time to time, he can secure all the requisites which combine to preserve through life these inestimable blessings, viz., cleanliness, regularity, health and beauty.

Again, there is no magic in a name, nor, in the promises of self-avarice. Are people too blind to see the fatalism of attempting to be, in the words of an English advertiser, "every one their own dentist"—by filling their decayed teeth with his paste, which one may do for himself, in a moment, and without pain!

The public should avoid being seduced by these "attractions," viz. "extraordinary cheapness," and operations "without pain." They may know that the one is attendant upon valueless services, and the other, a disregard for the patron's best interest. For it is evident, that the competent operator who is impressed with a

due sense of his responsibility, who employs sufficient time and perseverance, to do justice to his case; and, who uses a pure material, very costly in itself, must be liberally paid.

And where teeth are badly decayed, they are necessarily sensitive to the cutting instrument. "The wound must be probed to be healed," even so the decay must be faithfully cut out, to save the tooth.

An error of opinion is held by many physicians; that whereas they are conversant with the sciences taught in a Medical College, they are perfectly qualified by those studies, for the practice of Dental Surgery!

Medical works generally, are vague, and incorrect in their treatises upon diseases of the teeth, showing their ignorance of their true nature. And quite as defective are those on general anatomy and physiology, except, perhaps, some of late authorship. Physicians themselves, show that they have given but little, if any attention, to this branch of chirurgery. It is the remark of one of that faculty, who in early life turned his energies from the medical practice, entirely to that of dental surgery, and who by years of hard toil, made himself eminent also in its mechanical department—that the "physician's opinion on matters relating to the teeth, is no better than the parson's!"

This applied to those who are physicians *only*, will be found correct. They are, however, sometimes found operating on teeth, in the back part of their dingy shops, with an *unique* collection of clumsy "tools," (and a larger stock of self-conceit,) the chair, a common "windsor," and other fixtures in keeping. From these men we always see work that is of no utility; their scientific characters for other pursuits entirely fail to redeem it. He who aims at success, resting his faith upon abstract knowledge, would be as rational in expecting to manufacture a watch from his study of mechanics. A medical education is decidedly a valuable acquisition to the dentist; but particularly so is a *dental education* to *whosoever* would practice the art. Of what benefit can it be to the person who has carious teeth, to have them imperfectly excavated, and filled in a loose and unstable manner, though it be done by a medical man? By whomsoever, it is an *injury*; for *thus*, they are still pervious to the vitiated fluids of the mouth,

and the stopping serves as a nucleus for their accumulation within the tooth, by which it must be more speedily decayed.

This most important and difficult operation—plugging teeth—is, in its perfection, the highest attainment of our art. But that cannot be reached, even by those who have the most learned *conceptions* of it, except by fatiguing experience, and the necessary means.

Nor is it given through *instinct* to the barber, the blacksmith, or the blockhead, who, too stupid in his vocation to obtain a livelihood, abandons it to honest men, barter his stock in trade for turnkeys and “gold leaf,” and assumes his Sunday clothes, and the title of “Doctor.”

Among the most important of these instrumentalities, to the want of which may be attributed the failure of professional and non-professional men, to arrive at that point of excellence, are the following:

Premising that it is folly to suppose a physician capable of doing justice to the practice of his profession, and, at the same time, to that of dental surgery—the latter in itself, is an ample field for a life of cultivating the best talents. There is no lack of eminent names to which we could refer as examples, for the truth of this.

The veteran PARMLY has even recommended that it be divided in practice, into two distinct branches—surgical and mechanical.

2dly. It is necessary to have a suitable *chair*; high enough to bring the patient's head up where one may *see* the state of the teeth. It is also needful to raise and lower the seat, the back, &c., as occasion may require. It should be *firm*, to give resistance to the pressure put upon gold in stopping teeth; and as that is often of the full strength of arm, to the end of making it perfectly solid, the chair must be unyielding to such force.

3dly. A good light is indispensable. Many operators literally *work in the dark*, and thereby work iniquity. For, without a *strong* light, they cannot see distinctly within a carious tooth, to know its true condition.

I have noticed where one advertiser is “prepared to operate in the evening, by gas-light!”

Large unshaded windows, fronting north, afford the clearest light. The chair should stand as near them as convenient, and

the operator will find his labors much facilitated by placing a mirror in such side-position as to reflect the sun's rays directly into the mouth.

4thly. Delicate instruments are requisite; and of such various shapes, and peculiar niceties, that no person can make them properly, who does not know how to use them. The *cutler* manufactures from a given pattern, which, at best, is only imitation. As he is ignorant of their peculiar application, he cannot have an eye for their minute proportions. The skilful operator continually finds cases requiring a new pattern of instrument, or which suggest an improvement upon old ones, according to his idea of their use. Now, it is impossible to convey that idea to the cutler, by which he can make the precise instrument.

The dentist should not fail to supply himself with various sizes of steel wire, and learn to make his instruments, by forging and filing them down, tempering, polishing, &c. This should be one of his occupations during his leisure hours; and he will find a great portion of that time required to keep his instruments in *proper* order. For my part, if I had not others than which the cutlers can furnish, I should think it impossible to work. (This has reference particularly to those for excavating, and the smaller ones for plugging. The general excellence of the cutlery and surgical instruments manufactured in the northern cities is well known.)

5thly. A skilful *hand*. All other means will fail at last, if they be not directed by a disciplined, mechanical hand. It has been well remarked to the readers of this work, by high authority, that if it be not drilled to such delicate manipulations before the age of thirty years, it is afterwards incapable of that mastery which might have been obtained in early life. This fact is aptly illustrated by its application to musical instruments; it is invariably found, that after even a younger period, it is impossible to make up for neglect in youth, and to practise the hand into a free and elegant execution. The same is well known of the finer mechanical arts.

No mistake can be greater, than that the profession is one of ease and emolument, and that it requires but little preparatory qualification. He that justly claims the honor of belonging to it, is not content with any low or middle rank, but he must gain

the very summit; and, to do this, requires, as has been fully shown, the longest life of unwearied diligence. The young dentist, on going forth into the world, has much to contend with. Though he be fitted for his responsible duties, at first the public rank him among those who have deceived them, and greet him with the contempt which they undoubtedly deserved. He, having too much self-respect to demean himself by low egotism, his success at the outset may not equal that of his *parvenu* contemporary, who thereupon takes occasion to republish his "extensive practice."

As the candidate for an honorable and lasting fame has in view to be *useful* to his patrons, he is never known to restore a decayed tooth in the astonishing space of twenty minutes; consequently, he does not surprise his auditors with extraordinary *day's work*.

His *entrée* is homogeneous to that of the young physician, than whom, perhaps, no candidate for public favor meets with more obstacles. The trials to which both are subjected, if known to those who would embark in such life for its pleasures, would reverse the ideal picture, and incline them to other pursuits.

In conclusion,—the young man possessing a liberal mind and education, a mechanical talent, and that spirit of enterprize which will direct all his energies to the improvement and enlightenment of himself and his calling, may feel assured that he can surmount all difficulties in this rugged path, which appears so falsely alluring to the thoughtlessness of youth, and so inviting to the avarice of the knave. And though for a while he meets with frowns from the world, yet his "good works" shall be perpetuated in the golden monuments he builds himself, proving him a benefactor to society, and an ornament to his profession.

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## Collectanea.

*Medical Writers Good Practitioners.*—We copy the following pleasant article from the *Boston Journal*. The unjust and illiberal notion which the writer combats, is a very common one, and is encountered in the every-day walks of the physician. A still greater prejudice perhaps exists against the physician who cultivates some one or more of the natural sciences. The chemist, the botanist, or the mineralogist, seldom enjoys much patronage as a practitioner. To some extent there is a reason for it, as chemistry, botany,

mineralogy and the kindred pursuits are so seductive, that he who becomes addicted to them is apt to *neglect* his professional avocations. But to the article :

An idea is prevalent in the world, and even fostered among medical men, perhaps from interested motives, that medical writers are not generally the best practitioners. The very reverse of this is more generally the fact. The nature of their researches obliges them to become familiar with the opinions and practice of the best practitioners, and to treasure them up with the most scrupulous attention. A store of useful and practical information is always at hand, which is ever ready to be applied to the cases under consideration and treatment. Writers, too, always provide themselves with large and respectable libraries for the purpose of investigating all the subjects on which they treat, as well as for the intrinsic value of the information they obtain from the perusal of them. Dr. Rush observes, "If a physician obtain skill by his own solitary experience, how much more will he acquire by availing himself of the experience of several hundred physicians, which he can only obtain by availing himself of the opportunity of perusing a large medical library." And if it be true, which can admit of but little doubt, that a physician cannot accurately remember the details of his practice more than three years, of how much importance is it that he should be in the habit of recording all important facts and cases which may occur to his notice and observation, and be continually treasuring up fresh stores of knowledge by unwearied attention to books. A physician's studies are never finished till the close of life. I was always very much pleased with the following anecdote of Dr. Rush. "As two young physicians were once conversing in his presence, one of them said—'When I *finished* my studies.' 'When *you* finished *your* studies!' said the doctor, abruptly; 'why you must be a happy man to have finished your studies so young! I do not expect to finish *mine* while I live.' "

Notwithstanding the above observations, we have too much reason to believe that a great proportion of practising physicians in America do not devote much of their time and attention to study after they commence the practice of their profession; and it is from this mental idleness, as Dr. Rush observes, that "it is no uncommon thing for an old physician (from his neglect of books) to be more ignorant than he was when he commenced the practice of his profession,"

Let it not be said that a physician has not time to record his experience or even to read. Some of the most extensive practitioners have been the most voluminous writers, and most industrious readers. In proof of this, we need only to mention the example of some of the fathers of our profession—such as Hippocrates, Galen, Celsus, Hoffman, Sydenham, Boerhaave, Van Swieten, Wistar, the Hunters, Monro, Cullen, and a host of others, almost all of whom were engaged in the most extensive and most lucrative practice, and were also authors of several most voluminous works. Dr. Good was one of our most elaborate writers. He has written several works,

besides his great one on the practice of physic, yet the income of his practice was seven or eight thousand dollars a year. Sir Astley Cooper more than doubled the amount charged by Dr. Good in the same space of time; and yet, he was continually furnishing the world, through the medium of his writings, with the result of his knowledge and experience. Innumerable other examples in Europe might be mentioned of a similar nature. In fact, the best and most learned writers there, were altogether the best and most successful practitioners. Dr. Clark and Sir William Jones may be added to this list. They never for a moment neglected the duties of their profession. Indeed they excelled in the practice of that profession, and they were among the most eminent in Europe, in science and literature.

Our own country, too, is rich in examples to prove that our best practitioners are, and ever have been, our ablest writers. Among our deceased medical men we need only mention the immortal names of Rush, Barton, Redman, Wistar, Dorsey, Dewees, Physick, Parish, Ramsay, Miller, Hosack, Godman, Eberle, Warren, Gorham, and numerous others, whose writings alone would fill a decent library. Among the living we take great pleasure in enumerating the names of Jackson, Warren, Bigelow, Hale, Ware, Hayward, Shattuck, Smith, Holmes, Woodward, and many others in Massachusetts; of Parsons, Senter and others, in Rhode Island; of Tully, Ives, Sumner and others, in Connecticut; of Mott, Beck, McNaughton, Reese, Paine, Lee, Forrey, the Smiths, Delafield, *cum multis aliis*, in New York; of the venerable and learned Coxe, Samuel Jackson, Hays, Gerhard, the McClellans, Horner, Gibson, Bache, Dunglison, Wood, Bell, and innumerable others, in Philadelphia; not forgetting the names of N. R. Smith, Annan, Sewall, and others, at the South; and Gross, Drake, Cartwright, Mussey, Hildreth and Kirtland, beyond the Alleghanies. Let no one accuse me of partiality in this enumeration. I am sensible that I have omitted the names of very many who have been equally successful with their pens, and in their practice. My object was not to give a list of our celebrated writers, for that would fill a sheet, but to mention a few which, without much reflection, presented themselves to my mind in illustration of the truth of the opinion that our ablest and most elaborate medical writers are also our *very best practitioners*.

W. W.

January 8th, 1843.

*Western Jour. Med. and Surg.*

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*Influence of the Seasons.*—1. The amount of sickness in the central districts of London, during the year 1842, varied directly as the temperature, being a maximum in August, the hottest month of the year, and a minimum in January, the coldest month.

2. The diseases which determined the order of sickness, were febrile and catarrhal affections; the contagious, exanthemata, and the disorders of the digestive organs; to which may be added the mixed group, consisting of gout, scrofula, &c.

3. The diseases of the organs of respiration followed the inverse order of those already mentioned, and were inversely as the temperature, being most numerous in the colder, and fewest in the hotter months.

4. The temperature did not appear to exercise a marked influence on the other classes of disease: with the exception, perhaps, of those which form a measure of the activity of the sexual passion, which were in excess during the hottest months of the year—a fact which corresponds with, and corroborates, our experience of the influence of the seasons on crimes against the person, &c.

5. The hygrometric state of the air appeared to have little effect on disease; and, if it produced any effect, it was on the diseases of the organs of respiration, which were in excess during the months in which the quantity of moisture in the air was the greatest; but these were also the coldest months.

6. The mortality for the metropolis during the year 1842, was greatest in the first quarter, and least in the second, and was inversely as the sickness, except that the mortality of the third quarter exceeded that of the fourth.

7. The diseases which chiefly influenced the order of the quarters in respect of mortality, were those of the chest; to which may be added, as following the same order, the decay of nature in the aged. It is well known that the most common cause of death, in the aged, is an affection of the lungs, called "*bronchitis senilis*."

8. The order of the seasons in respect of sickness and mortality differs year by year, and does not admit of being reduced to any precise rule.

9. As a general rule, but one admitting of many exceptions, it may be stated, that the amount of sickness tends to vary directly, and the amount of mortality inversely as the temperature.

These results must be received with some reserve, as they are founded on a comparatively small number of facts; but they are, probably, not very far from the truth. At any rate they may prove suggestive of future inquiries, founded upon a broader basis. At present the materials for a comprehensive theory of the influence of the seasons and weather upon sickness and mortality are wanting, and are not likely to be supplied till the example set by one or two public hospitals and dispensaries shall have provoked imitation. In the meantime, the present attempt, if it accomplish no other purpose, may serve as an example of the mode by which such inquiries must be conducted.

In the course of this inquiry it is scarcely possible that some hypothesis should not have suggested itself as the most likely to prove true; and it may not be amiss to bring this attempt to a conclusion, by stating in a few words that which I have been led to form.

The causes of sickness are twofold, consisting of atmospheric changes which may be submitted to measurement, and of certain more subtle changes in the composition of the air, which, at present, can neither be analysed nor estimated. To the former class belong the temperature, moisture and pressure, of the air; to the latter those emanations from the earth, or from human



beings themselves, which give rise to the majority of epidemic, endemic, and contagious diseases. As the number of cases of sickness produced by these latter causes, is generally considerable, the influence of the pressure, temperature, and hygrometric state of the air, will not be observed in those years in which these causes are in operation; but in the absence of epidemics, the temperature will be found to be the most influential cause of sickness. When the temperature of the summer is high, there will be such an amount of sickness in the summer months as to cause a large return of sickness for the entire year; so, on the other hand, a severe winter will swell the total sickness of the year, by producing a great excess of affections of the organs of respiration. A summer or winter of unusual length, beginning early and ending late, will also cause an increase of sickness on the entire year; but the nature of the sickness will be different as the temperature is higher or lower than usual. The order of the seasons in respect of sickness will also be mainly determined by the degree in which the temperature of these seasons exceeds, or falls short of, the average temperature.

The mortality, in like manner, in non-epidemic years, will be chiefly dependent upon the temperature, varying in the several seasons inversely as the temperature, except in those years in which the summer is unusually warm, when the mortality of the summer may even exceed that of the winter season. In other instances, the mortality of the summer months will rank next to that of the winter or autumn.—*Dr. Guy, in the Quarterly Journal of the Statistical Society.*

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#### METALLIC PASTES FOR FILLING TEETH.

*Royal Succedaneum, Enamel Cement, Bone Paste, Diamond Cement, Mineral Paste, Lithodion.*—These are some of the names of a compound of mercury and other metals, by the use of which, for filling carious teeth, the public have been imposed upon again and again within the last thirty or forty years. With some slight variations, it has always been the same base article, under whatever name it has been presented.

I have always been unwilling to appear as an expositor of the abuses in dentistry which are at all times so much practised around us, except when they have become so excessive that I could keep silent no longer. And although I have witnessed the effects of this mercurial preparation for a long time, since its last introduction into our city and neighborhood, under one or another of the above imposing names, I have forebore to notice the article in this way till I should be fully satisfied, by repeated examinations, of its nature, and result of its application.

Testimony relative to these points has been so abundant, and has flowed in so fast, of late, that it would be a violation of duty and conscience not to speak out, and speak plainly concerning it.

Teeth filled with this *mercurial composition* are almost immediately changed in their complexion. Front teeth, in a few days after this *cement*

has been placed in them, become so blue or black as to be ruined in their appearance, while it is retained, even in cases where the anterior enamel is so perfect that a well-placed gold filling would not in the slightest degree change its natural healthy hue. Back teeth are often rendered so black, even into their fangs, that it is difficult if not impossible to restore them; and all this from the dark oxyd or salts of mercury which are formed from this metal in such a situation. Let one of these lumps of *cement* be removed after it has been placed in a carious tooth a few weeks, or in most cases in less than one week, and it will be found that its hidden surface, which was in imperfect contact with the tooth, will be as black as gunpowder—to say nothing of the offensive state of the tooth itself. But in addition to these effects, which are of the *least* consequence in the list, there follow pain, swelling, gumboils, ulceration, inflammation extending to adjacent teeth, swelling of the glands about the tongue, throat and neck, neuralgia about the jaws, face and temples; and where several large fillings are placed at about the same time in very hollow teeth, even *salivation* is produced in those who are highly susceptible to the influence of *mercury*. All these are effects which I have either witnessed repeatedly, or of which I have obtained accounts from the most respectable dentists in our country. I am even now called from writing, to examine a case—the effects of a large filling of “*lithodeon*,” in which the under surface of the tongue is constantly irritated, and has been several times ulcered by coming in contact with the mercury. And I have a collection of specimens—teeth that have been extracted, charged with “*lithodeon*”—which will fully illustrate the above statement; for I have found it requisite to extract more adult teeth in the course of the last two or three years, on account of the mischievous effects of *mercurial paste*, than for any one other cause, sufficient time having elapsed, since its last introduction here, to show, not the immediate bad consequences, but very many of the remote.

The testimony of Dr. E. Parmly—a gentleman of high professional reputation in the city of New York—should have much weight in relation to this matter. He has in several instances expressed his opinion publicly concerning it. His language, as quoted in Maury's Dental Surgery, p. 152, is—

“For this operation” (the filling of teeth) “gold is the only substance known that can be permanently relied upon; although there are cases in which tin, and even lead, may be of temporary service when employed with skill and judgment. I regard cements, fusible metals, amalgams, succedaneum, and all other substitutes for the above-named metals, as impositions on the public, never having seen a single operation in which these substances were employed, which would not have been more permanent, if even lead, the poorest of these metals, had been used; because it is less subject to decomposition and oxydation, to say nothing of the poisonous qualities of the mercury which most of the others contains. I have never known a perfect master of the art of stopping teeth either to employ or recommend the substances which I here condemn; and I believed the use of them

is almost wholly confined to those persons who are unacquainted with this nice and difficult art."

This mercurial compound is still in use in our city and the country about it, I will not say by dentists, but by a host of impostors, "operators on teeth," whose advertisements fill a part of almost every newspaper; some of whom perhaps are even ignorant of its deleterious effects, but many of whom know well its qualities, and too well to trust it in their own teeth. It is an article which can be applied by any who can stop a hollow tooth with wax or putty, and if it could be retained no longer than these, its evils would be very greatly diminished.

I am fully aware that these *cements* or *amalgams* have been used in some cases where they *seem* to be of service; but here, still, is deception; for in all such that have come under my observation, (and these are very numerous,) it can be demonstrated, by an examination of them, that great mischief is going on beneath such fillings, and that a different and better treatment might have been adopted.

J. F. FLAGG.

Boston, Dec. 5th, 1843.

Boston Med. and Surg. Jour.

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*The Blue Lick Springs of Kentucky.*—Through the entire mountain ridges of Virginia, the medicinal waters are gushing out at various points in copious streams; but some few locations have more reputation than others, which they will doubtless maintain for generations to come. In the state of Kentucky, there are fountains equally distinguished for their properties in subduing a variety of diseases, yet their geological relations are quite different from those on the lofty elevations of the Alleghanies. They bubble up in peculiar depressions on the line of shallow ravines, technically called, in the vernacular of the country, *licks*. There are the *Blue Licks*, *Big-bone Licks*, &c. &c., well known to the traveller, the geographer, and those in pursuit of health.

From a remote antiquity, the wild animals of the forest traversed the whole region of country to gratify a strong and perhaps innate propensity for salt, which was held in solution in the water that was forced out of the ground at the licks. Nearly the whole if not all the licks are saline springs. There, countless herds of buffaloes, the deer, and perhaps all the smaller animals, met at one common rallying place, to lick their mother earth, saturated with marine salt. There, they probably contended for the right of possession, warring upon each other from age to age, in the solitary gloom of a mighty forest, undisturbed by the footsteps of man, and there accumulations of skeletons were left to bleach and decay—the memorials of brute warfare. But long before—even at an epoch so distant that geology itself furnishes no data for a probable conjecture in respect to the period—the mastodon, colossal in size, and powerful in strength, sought the same licks, and gratified the same indomitable appetite for salt that characterizes the races that have been ushered into being since its gigantic bones have been fossilizing under the feet of a new order of animal organization.

There is neither exaggeration nor extravagance in these observations, however much the relations of naturalists may excite the marvellousness of the unlearned in this rich but poorly cultivated domain of natural science. Within the last six weeks, some extensive improvements have been in progress at the Lower Blue Lick Spring, requiring an enlargement of the well, in order to line it with stone. In digging only about three feet from the water, laterally, five feet below the surface, the tusk of a monster animal was uncovered, six feet two inches in length, by twenty-two inches in circumference, some portion of which is still in a tolerable degree of preservation. There were also several enormous grinders, that might have remained there, for aught that is known to the contrary, till the elements shall melt with fervent heat, unchanged in form, and unaltered by the corroding influence of time. These extraordinary trophies, so recently discovered that their advent has not before been chronicled, now lie on the office floor of the hotel, for the inspection of visitors. Such bones are unquestionably lying but a few feet below the soil, over the whole basin of the lick.

On the Lexington turnpike, twenty-four miles from Maysville, Ky., is the *Lower Blue Lick Spring*—a fashionable resort for persons of leisure, during the sultry months of summer, and celebrated for its many medicinal properties, and consequently a great focus to which invalids concentrate from all parts of the United States. After passing through several hands, it has finally come into the possession of two or three brothers, who are conducting the establishment on a scale of elegance very satisfactory to the peripatetic public. The Spring is leased for ten years at an annual rent of \$1500, with a right to a deed by the payment of \$25,000 at the expiration of the contract. Large quantities of the water are sent off in barrels, at \$1 a barrel, but \$2 is asked if the casks are furnished by the proprietors. It is said that the sales have amounted to \$4000 in the last two months. Such is the increasing demand, that New Orleans, Mobile, Natchez and Cuba have become extensive markets for it. Agencies are being established so actively, that it is fully believed the annual sales may reach as high as \$12,000 within a few years.

When the water was used expressly for manufacturing salt, it required 800 gallons to yield one bushel—being in the proportion of 1 to 80. According to Dr. Yandell's analysis, it contains—sulphuretted hydrogen, 2; carbonic acid, 3; muriate of soda, 4; muriate of magnesia, 5; muriate of lime, 6; sulphate of lime, 7; sulphate of soda, 8; sulphate of magnesia, 9; carbonate of lime, and probably, says that able chemist, a trace of carbonate of magnesia. In its action upon the system it is purgative, diaphoretic, diuretic, and alterative, and stands highest in rank in the catalogue of salino-sulphureous waters. On the report of the same gentleman, it is identical with the Harrogate waters of England. With respect to its effects on the system, according to the representation of its friends, all maladies yield to its sovereign influence. They melt away under its potent agency, like the odor of plants on the wings of a zephyr. It blows hot or it blows cold: in a word, it gently brings down the overgrown rotundity of a gourmand, or

fattens the frail tenement of his antipode in dimensions. It is the misfortune of all mineral waters, in this country, either to be overrated by the incompetent, or underrated by physicians. When medicine has been judiciously prescribed for a considerable season, without manifest advantage, in certain obscure visceral, or perhaps cutaneous, affections, the patient not unfrequently posts off to a spring. There he drinks, till a restoration has been accomplished, not by the course he is pursuing, but mainly by the action of the very medicinal treatment that is overlooked—the exercise of a strong faith in the all-healing influences of the fountain. Better analyses are wanted. A more careful series of observations by medical men than have yet appeared, and a proper reliance on common sense and the wisdom of judicious practitioners, are also needed by those who hope for the most in visiting thermal or the ordinary mineral waters of any place.

Nothing short of miracles are ordinarily performed at the onset, in the estimation of new comers—an error that is soon corrected when the old malady peeps out again, after it was exorcised by the potency of a celebrated water. Finally, we have come to the conclusion that our real knowledge in regard to the true medicinal value of these waters, is very small indeed. There is abundant room for inquiry, and an imperfectly explored field is before the world, however much it may be bruited that nothing further remains to be investigated in relation to them. So many persons are interested in them as properties, that many obstacles are in the way of testing points of considerable moment; but after all, were the springs not the centres of fashionable life, where strangers, the elite from every community, far and near, concentrate to eat, drink, dance and be merry, they would at once be bereft of their reputation, and ultimately sink into utter oblivion, save in the estimation of those who might seek them from a higher motive, to be cured of a real and not imaginary disease.

Hoping hereafter to notice the characteristics of the White Sulphur, the Red, Blue and Sweet Springs of Virginia—the Warm and Hot being already partially disposed of—we shall then give attention to the Harrodsburg and Big Bone in Kentucky.—*Boston Med. & Surg. Jour.*

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*Compliment to the Memory of Sir Charles Bell.*—Sir Robert Peel has addressed the following letter to Lady Bell:—

*Whitehall, September 4.*

“Madam,—I have had great pleasure in recommending to Her Majesty, that in consideration of the high attainments of your lamented husband, and the services rendered by him to the cause of science, a pension of one hundred pounds per annum for your life, shall be granted to you, from that very limited fund which Parliament has placed at the disposal of the Crown for the reward and encouragement of scientific labors.

This pension, small in amount as it necessarily is, will perhaps be acceptable to you, as a public acknowledgment on the part of the Crown, of the distinguished merit of Sir Charles Bell.

I have the honor to be, Madam, your faithful and obedient servant,

ROBERT PEEL.”

## Miscellaneous Notices.

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*Cheap Dentist*—Is a term, synonymous with *poor dentist*, or rather, *no dentist*, and is regarded by those who know best, as in most instances, designating one of a class of practitioners, who, without a knowledge of even the first rudiments of the science of dental surgery, attempt to practice it; and for the purpose of securing patients, promise to perform all operations pertaining to the art, in the *most skilful* and *scientific manner*, and at *prices so low*, that all, who are not afraid of being duped, may avail themselves of them. If there are any who are disposed to question the correctness of this definition, its truth can be fully attested by most of those who have had the misfortune to fall into the hands of dentists who advertise to perform operations at prices two-thirds less than is usually charged. The operations performed by this description of practitioners, are usually, indeed, cheap, for in most instances, they are not only worth nothing at all, but are oftentimes productive of actual, and not unfrequently, serious, and irreparable injury. And yet, these dentists are patronised. Some go to them because they are not able to pay for such operations upon their teeth as would be really serviceable to them; others are influenced by penuriousness—a false system of economy—and it oftentimes happens, that they pay twice as much in the end, as it would have cost them, to have secured, in the first instance, the services of a competent, skilful practitioner. The first are to be pitied, but the second are deserving of no sympathy. Those who allow themselves to be gulled by every one who calls himself a dentist and advertises cheap operations, have no one to blame but themselves: others again, go to them, not knowing that any special qualification is necessary to practice this branch of surgery, and under the impression that one dentist is as good as another.

The civilized world abounds, at present, with *cheap*, or rather with *quack* dentists. They are to be found in every city, and almost every town in the land, and they will continue to multiply as long as so many seek for *cheap*, rather than *skilful* dentists, and the laws of our country institute no guards around the profession, for the suppression of empiricism.

The tracks of these vandals are daily met with in the mouths of those who have fallen a prey to their ruthless depredations. The injuries they inflict are oftentimes of a very serious nature, and not unfrequently continue through life. They seem to have but one object in view, and that is, to fleece the pockets of their ignorant and credulous dupes. As for a scientific knowledge of the profession they attempt to practice, but which they disgrace, that is a thing with which they would not, on any account, burden their minds, since it is not at all necessary to their success. They can get along quite as well without it as with it, for as for benefitting their patients, that seems the last thing that enters into their calculation.

In our remarks upon cheap dentists, we only wish to be understood as

meaning *quack dentists*, who, among the means which they resort to, to gull the unsuspecting, advertise *cheap operations*. We do not recollect to have ever known a scientific, thoroughly qualified and skilful practitioner, to resort to such contemptible trickery. It is beneath the dignity of honorable, high-minded men, and we believe that no one, worthy of confidence, would do it, and in the majority of cases where it is done, our word for it, those who do it, have yet to learn the first principles of correct practice. But while we disapprove of this species of deception, we do not, by any means, wish to be considered as advocating exorbitant charges for dental operations. Those who charge exorbitant prices for their services, are equally destitute of honesty, and generally found to belong to that class of *quack dentists*, who, while they are but little, if any better qualified to practice the art, are possessed of a far greater amount of assurance, and it is to this, that their success is attributable. The scientific and really well qualified of the profession, are generally men, who, while they are constantly devoting their best energies to perfect themselves in the science, that they may the better be enabled to benefit their patients, they expect in return for their services, from those whose circumstances will permit, a fair compensation, and nothing more.

It would be impossible to estimate the amount of injury—the thousands of teeth that are annually destroyed by *cheap* (quack) dentists. The following, from among the cases that are almost daily falling under our observation, will serve as examples of the results that usually follow their operations.

A lady, accompanied by two daughters, one about nineteen and the other seventeen, called upon us, a few days since, for the purpose of obtaining for them, our professional services.

The teeth of both were constituted very much alike, and had been operated on about two years and a half before, those of the eldest by a skilful dentist, but as the mother thought the fee which he charged for his services, a very exorbitant one, she took her other daughter to another dentist, who advertised to perform all operations upon the teeth at one-third the prices usually required for such services. At the time her daughter's teeth were first operated on, the eldest had ten filled and six filed, for which, the dentist charged twenty-five dollars; the youngest had six filled and four filed, and for which, a charge of only eight dollars was made. The mother congratulated herself on having saved, as she supposed, seventeen dollars. Three months, however, had hardly elapsed, before it was found that the decay in the youngest daughter's teeth was still going on. The cheap dentist was again visited, and this time he managed to make a bill of nine dollars, and about six months afterward another of twelve. At the expiration of twelve or fifteen months, the disease being found to be still progressing, the confidence of the mother in the skill of the dentist who had operated on them, had become so much shaken that she determined to consult another, who proved to be of the same class as the last, and after having paid this one thirty dollars, she was induced, by the persuasion of some of her friends, to call upon

us. She was accompanied by her eldest as well as by her youngest daughter, and after having given us an account of the operations performed upon the teeth of both, desired that we should do for them whatever we might deem necessary, *provided*, we would be *very moderate* in our charge.

The teeth of the first which had been operated on, were, with the exception of one, in a healthy condition. Nine of the fillings were still perfect—the tenth, by a decay which had commenced in another part of the tooth in which it had been placed, and that had extended to it, was so much loosened that it was no longer of any service. Four or five of her other teeth were decaying, but the disease had not yet progressed so far as to prevent their restoration. The other daughter had lost the crowns of two of her upper incisors, two bicuspidates and three molares. The crowns of the two remaining superior incisors and two bicuspidates, a cuspidatus, and three molares, were so much decayed as to render their restoration hopeless.

The teeth of the youngest daughter had been filled with gold as well as those of the eldest, but the fillings had not been as skilfully put in. Five, it is true, were still remaining, but they could all have been placed, by a well instructed hand in one cavity.

Now it is obvious that the exercise of this false economy, had not only called for the expenditure of a much larger amount than would have been required to have secured, in the first instance, the services of a skilful practitioner, but had also resulted in the destruction of nearly half the teeth of the youngest daughter.

The *cheap dentists*, in this, as they do, in almost all other instances, prove, ultimately, to be the *dear* ones. We will give one other example before we close our remarks upon this subject.

Mrs. W——, wishing to procure a double set of artificial teeth, applied to Mr. W——, who advertised to insert them at sixty dollars a set. The teeth were obtained, but they did not fit; they caused great irritation to her mouth, and the upper circle did not antagonize properly with the lower. Besides, they tasted so much of copper, that she was apprehensive that their presence in her mouth might be productive of injury to her health. She went back to her dentist a number of times, and stated all of these objections. He tried to persuade her that they were imaginary, he assured her that the plates on which the teeth were set, were pure gold, and that if she would wear the teeth a few months, the jaws would so adapt themselves to the teeth as to cause them to come together properly and fit easily; but, as she could not do this, she determined to go to another dentist. She visited several, and they all told her that the teeth she had, were worth nothing—that they could not be altered so as to make them answer the purpose, and that such a set as would be really serviceable to her, would cost more than double the amount that she had paid for them. Not willing to pay so much, although abundantly able, for a set of artificial teeth, she went to another *cheap* dentist, and obtained another set, which proved to be no better than the first. She now had two sets, but could wear neither, and although her confidence in



the art had by this time become greatly shaken, she was nevertheless resolved to make trial of one more set. She had had enough of *cheap* dentists, but still, was anxious to procure a set at as low a price as possible, and for this purpose called upon several dentists—ourselves among the number, but as we were so much occupied as to be unable, just at that time, to undertake the operation, she called upon, and obtained the services of a professional friend of ours, who put up for her, a very beautiful and substantial set, for which he charged one hundred and fifty dollars. These teeth she has now worn nearly two years, and having accidentally met with her a few days since, she informed us that she had already been more than compensated, in comfort, for the amount which her last set of teeth had cost her.

In conclusion, we could enumerate, were it necessary, scores of examples as striking as the foregoing, of the bad effects and inutility of the operations of most of those who advertise themselves as *cheap* dentists. There is something suspicious in the name, and those who do it, seem to rest their claim to confidence and patronage upon it, without any reference to qualification or a knowledge of the art, taking it for granted that this will be inferred, if it is but known that they charge less, than what the profession generally do, for their services. By this shallow artifice, hundreds and thousands are being, almost constantly, deceived.—*Balt. Ed.*

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*Dr. R. Somerby's Concentrated Blow-Pipe and Furnace.*—The inventor of this most admirable contrivance, has done the profession a great service, by furnishing a machine so highly beneficial and useful as is his Concentrated Blow-Pipe and Furnace. Soldering by the ordinary method, is not only hurtful to the lungs, but also to the eyes, which liability to injury is wholly obviated by this apparatus. And while it not only greatly facilitates this operation, it is in every respect, admirably adapted for melting gold and metal for models. To such of the members of the profession as have many artificial teeth to insert, it is invaluable; we had an opportunity of seeing it in operation a few weeks since in the lecture room of the Baltimore College of Dental Surgery, where it was exhibited by Dr. Wm. H. Goddard of Louisville, Ky. and are therefore prepared to commend it to the attention of the profession as worthy of notice. So much, indeed, were we pleased with it, that we at once ordered one for our own use. The cost may deter many from purchasing it, but we believe that might be saved by it in a single year by a dentist in full practice, and as serviceable as it is to dentists, we should suppose, that it would be equally useful to chemists and mineralogists.

*Balt. Ed.*

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*To Correspondents.*—We regret that Dr. Thackston's very interesting Essay was received too late for insertion in the present number of the Journal. It shall, however, appear in our next, and we hope he will continue to furnish us with contributions from his able pen.

*Gossip with our Profession: by the Junior Editor.*—Much diversity of opinion exists respecting what is the proper shape and curve for the hook or claw of the key instrument for extracting teeth. Some advocate the claims of a section of a circle, some prefer a section of an ellipsis, &c. We have one, (the *only* one we ever saw,) copied after the eagle's claw, which, with a little greater curvature, we made it to resemble as nearly as we could and adapt it to its shaft. To prevent its slipping sideways, we filed the point so as to make it an edge one-sixteenth of an inch wide, and then divided this edge into two points, the dividing notch being about one-twentieth of an inch deep. We like this hook greatly:—because, 1st, it may be applied to a tooth at any point of its side, so as to *rotate* the tooth (an effect sometimes desirable) at the same time that it is rising from its socket, and turning toward the shaft of the instrument. 2dly. It may be applied without much displacement of the gum, thereby lessening the amount of suffering from the operation. 3dly. It has just enough metal, and in just the right place, to be strong enough without being clumsy. Supposing our hook to be an arc, its chord, measuring from the points to the centre of the hole, is about three-fourths of an inch in length, and its versed sine, measuring to the inside of the hook, about half an inch. . . . Those who would (and who would not?) prefer having their dental plates and clasps bruised and bent as little as possible in the cutting out, are respectfully advised to *save* them out. Canfield & Brother, of Baltimore, sell a saw-frame and a dozen saws—enough to last a life-time—for \$1 75! The same gentlemen also sell a host of other things that dentists need, and at rates so very reasonable, that, were it not for the very civil manner in which you are dealt with, you would be surprised to find you had bought so many of them. . . . Notwithstanding all that has been said, and written, and published, and circulated, all over christendom, about the deleterious, nay, ruinous effects of the mineral acids when used to clean (whiten) the teeth, there are still men in our profession, to its great disgrace, and in this nineteenth century too, when chemistry has been elevated to one of the most beautiful and fascinating of the exact sciences, men who still use, and have, some of them, grown grey in the use of, mineral or other acids, to clean the teeth of their (God help them!) confiding patients. We have ransacked, in vain, every tongue of which we have any knowledge, for terms sufficiently energetic to express our utter abhorrence and strong condemnation of this most reprehensible practice. . . . The proposition of C. will be acceptable, provided he does not use too much space in advocating things admitted to be correct, nor describe too minutely that which is familiar to nearly all who read this work, as he has done in the article sent for insertion in the Journal. Caoutchouc (not "*catouche*," Mr. C., though we think yours an improvement,) has been for many years, and is now, by many, and we think ought to be, used for separating the teeth, where they do not *need* to be cut away at all. C's objection is evidently against the too common and very pernicious practice of so filing the teeth that the filed surfaces soon are in contact. . . . Some of the dental instruments sold at the shops seem better fitted for the use of an amateur

gardener than a dentist. Only think of having your salivary calculus removed, "in the most scientific manner," with a great triangular hoe! . . . . In tying ligatures upon the teeth, to regulate them, the first half of the ordinary knot is with difficulty kept tight until the last and binding half is added. Our knot is this: in tying the *first* part, we put one end of the string *twice*, instead of *once*, around the other, and let the knot be in some part of the ligature that is drawn tight upon a tooth. This will not slip if the ligature be waxed. The *last* part is like either half of the ordinary knot. . . . The last professional trick to get business, of which we have heard, is, to couple your name with one very nearly like that of some dentists so eminent that even the street they live in is well known thousands of miles away, advertise yourselves as from the same street, (without giving number,) and when asked whether your associate is such or such a one of that name, reply that it is neither, but one of the same family. Thus, you may *dodge* an answer that would convict you of a gross deception, and *palm a lie* upon the dear gullible public.

M.

Washington, Jan. 1844.

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*Obituary.*—It is with sincere regret that we are called upon to announce the painful and melancholy intelligence of the decease of Dr. H. H. HAYDEN, Professor of Dental Physiology and Pathology, in the Baltimore College of Dental Surgery, and President of the American Society of Dental Surgeons. He died on Friday, the 26th of January, in the 75th year of his age. With his decease, has fallen one of the brightest stars in the dental profession; to which, as well as to science, his loss will be deeply felt. Engaged in the practice of dental surgery, for about forty-five years, he devoted himself to its study with the most untiring zeal, and during this period contributed many able and valuable papers to the literature of this department of the curative art. Possessed of an investigating and inquiring mind, he, in the mean, extended his researches to several of the collateral sciences, and in some of which, had become eminently distinguished for his profound and critical knowledge. He is the author of a very able and highly interesting work on Geology, of upwards of four hundred pages, published about twenty years ago. But he is gone, and we are called to mourn his loss—a loss which will be severely felt among a large circle of relatives and friends, as well as to suffering humanity.

His life has been a life of usefulness, and had it been consistent with the will of Providence, we could have wished that it had been prolonged for many years yet to come. But although he is no more an inhabitant of earth, his memory still lives, and will be ever cherished by the members of the profession he so long adorned.

The intelligence of this sudden and melancholy event, reaching us as it has, while from home, and just as the last sheets of the present number of the Journal were going to press, we are prevented from making a more extended notice of it at present, but shall avail ourselves of a future occasion to speak more at length upon the subject.—*Balt. Ed.*

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ARTICLE I.

*Obituary Notice of Prof. Horace H. Hayden, being a Valedictory Address to the Graduating Class of the Baltimore College of Dental Surgery.* By THOS. E. BOND, JR., M. D., Professor of Special Pathology and Therapeutics, in said College. February, 1844.

GENTLEMEN:

Your diligence in study has resulted, as diligence mostly does, in complete success. You have passed through your college terms with credit to yourselves and satisfaction to your instructors, and we have met to confer upon you, publicly and solemnly, the most formal testimonials of your fitness to practise the dental art. Upon an occasion so interesting as this, when tender and generous emotions are more than commonly active; when retrospection and anticipation alternately subdue the feelings and elate the heart, it cannot need the badges of mourning which we wear, to remind you that Death has been among us. That vacant chair has solemn meaning. Dr. Hayden is *dead*. A few weeks ago, he was your *instructor*; your hearts will add, he was your *friend*. In years, in knowledge, in devotion to your interests, he was superior to us all; and his absence from this place, this evening, cannot but invest the occasion with much of gloom: cannot but mingle with your gladness much of sorrow. I do not know how this parting hour between pupils and teachers can be better improved, than by setting before you the example of him we mourn,

and thus exhibiting to you, in the history of real life, the advantages of those principles and that conduct which he who is dead, and we who survive, have been anxious to recommend to you. Let him who has often taught with words, once more teach by example, and let the eloquence of a long and useful life combine with the solemn recollections of the dead, to impress upon you all-important lessons.

Dr. Horace H. Hayden was born in Windsor, Conn., on the 13th of October, 1768. A friend of his early childhood speaks of him as a most interesting boy. At a very early age he manifested great vivacity and unusual intelligence. He learned to read almost as soon as he did to talk, and at once contracted that fondness for books which was so remarkable in all his subsequent life. Nor was this the mere childish fondness for narrative which leads all little people to number books among their most amusing toys. Little Hayden's reading was of a character which indicated rare precocity of mind.—He not only toyed with books, he carefully and laboriously read them. Such was his industry and systematic application, that at the age of four years he had read the bible regularly through. It is well worthy of remark, in connection with this anecdote, that from early childhood to the day of his death, the bible was his favorite book. Ardent and inquisitive as he was, and multiplied as were the departments of knowledge which he undertook to explore, no study could allure him from the study of God's providence and grace; no volume could fascinate him away from the majestic revelation of the Almighty will. Though from his youth he knew the scriptures, yet, until hoary age, he learned therein, exhibiting a striking exemplification of the fact, that no man neglects the bible because he knows it well. Few men were more strongly tempted to forget the pious instruction given at their mother's knee than Dr. Hayden was. He was, in very early life, thrown into associations which might have tried the integrity of far riper years, yet in the gayety of youth he did not forget the law of that Being whose fear was so early implanted in his breast. In riper years he passed through the fiery trial of scientific scepticism; and though gifted with a bold and inquisitive mind, and devoting himself with ardor to the study of those sciences more particularly usurped by infidel philosophy, he

passed through the fire unscathed, and triumphed where thousands fell. Can it be doubted that the mind of this uncommon man was saved from pollution by his early acquaintance with the oracles of God? Was not his escape from the maelstrom of literary atheism, which once drew into its fearful vortex almost all the brilliant minds that came within its sphere, due to the wisdom of that pious mother who directed the powers of his infant mind to the true source of wisdom?

Dr. Hayden did not only read the bible, he studied it. Eagerly availing himself of every aid he could obtain, he examined the sacred page with the same care with which he conducted all his search for truth. The many notes scattered through his bible indicate the critical particularity with which he examined every doubtful passage, and the careful steps by which he essayed to reach the truth. While a boy, he exhibited a remarkable fondness for natural history, and would frequently surprise his friends by the ingenuity and success with which he would discover objects of interest, while rambling through the fields or woods. I need not remind those who knew him how remarkably this propensity was exhibited in his after life. At ten years of age, he began the study of the ancient languages, but from some cause, now unknown, but probably from want of means, he soon abandoned it. As his knowledge of the world was enlarged by intercourse with books, he became more and more desirous to see the things of which he read. But he was not a child of fortune. Like most other men to whom God has given uncommon minds, he was born of obscure and poor parentage; but young Hayden was not to be daunted by the want of facilities of travel. Goldsmith made the tour of Europe without a penny in his pocket, and without the inclination to earn one. Young Hayden had one advantage of the poet,—he was willing to work his passage to foreign lands, and, at the age of fourteen years, importuned his father so earnestly that at length he reluctantly consented to let him go to sea. Accordingly, in a few days he entered a fine new brig, in the very humble capacity of cabin boy, and in her made two voyages to the West Indies. By this time, his desire of travel was so far satisfied as to induce him to decline, for the present, the life of a sailor, and he returned to school and to his books, with the greater

zest for his long separation from the pleasures of study. Neither life upon the ocean, nor servitude in the cabin, had damped his ardent love for the study of nature. What time could be spared from the school house and the duties of home, was devoted to rambles, from which he rarely returned without some trophy of his love of nature.

When sixteen years old, he was compelled to leave school, and apply himself seriously to providing for his maintenance. Very reluctantly he submitted to be bound apprentice to a practical architect, whom he served until he arrived at man's estate. Although he was not pleased with this arrangement, which must of course have seriously interfered with his favorite studies, he addressed himself to his new business with characteristic ardor, and soon found sources of abundant pleasure in the study and practice of building. While his hands were employed, his mind was still more actively at work. He read whatever he could find written on architecture, and not content with studying modern works, sought for the oldest, and, to others, the least attractive. It would have been strange if he had not made great progress by so much diligence. Indeed, I am informed that he has left behind him drawings, and writings, on architecture, which are highly creditable to his knowledge of that beautiful art.

Soon after he came of age, he sailed for the West Indies, and sought employment in his business at Point Petre, Gaudaloupe. He succeeded very well, but the periodical fever compelled him to return to the land of his nativity. In the following year, he again visited the West Indies, and again was driven to the hills of Connecticut, by dread of the pestilence that walketh in darkness and wasteth at noonday. This was the last of Mr. Hayden's adventures beyond sea, in quest of fortune. For several years after his return, he continued to pursue his business with great industry, continually aiming to add to his knowledge, and ambitious of distinction in his vocation. His absence from home, and exposure to the enervating influence of tropical suns, and the more baneful effects of tropical habits and manners, had not lessened his love of knowledge, or disinclined him to the laborious exertion necessary to acquire it. His books were still his constant companions, and, as one who knew him well, strongly expresses it, "he found time for every thing but *idleness*."

Being dissatisfied with his prospects in Connecticut, he visited New York, when in his twenty-fourth year, and sought employment as an architect. Being successful, he concluded to spend the spring and summer in that city, and in the winter returned to Connecticut. But he was not contented to hibernate at ease; while debarred from his ordinary business by the winter's cold, he found employment for his restless mind, in teaching school in the neighborhood of Hartford. In this new vocation he succeeded so well, that he was strongly urged to continue in it; but a circumstance had now occurred which had turned his restless mind in a new direction, and permanently decided his lot in life. While in New York, he had occasion to call upon Mr. Greenwood, an eminent dentist, for some professional aid. While under treatment, the thought suddenly struck him that he would like to be a *dentist*. What he saw or felt in the manipulations of which he was the subject, to excite his admiration, does not appear, but the notion took fast hold of his mind, and happening about this time to meet some heavy losses in New York, he determined at once to throw up his business, which he had acquired with so much labor, and devote himself to dental surgery.

To this end he procured and read the very few books upon this subject which then were accessible, and having satisfied himself, by various essays, that he need not apprehend deficiency of mechanical skill, he bade farewell at once to architecture and to New York, and turned his face southward in quest of a location where he might hope to win fame and fortune. Arriving in this city, forty years ago, a poor man, without friends, and but imperfectly acquainted with the art upon the practice of which he ventured to depend for subsistence and respectability, his situation would have been discouraging indeed, had he not been sustained by his indomitable energy and enterprising character, above all, by his earliest and best friend, his bible. Hiring a room in a frame house in Fayette street, Mr. Hayden invited dental practice, and, while inviting, sought to *deserve* it.

He was well aware that the art of dentistry as then understood and practised, was rude and but little entitled to be considered scientific. To a man of his quickness of parts and habitual industry, it was a small thing to equal the best operators of his day.



He aimed to do much more ; far from being satisfied with having attained to the highest standard of excellence, then afforded by the art, he labored to elevate the employment to a parallel with his own abilities, and make it worthy of the partiality which he had so suddenly and strangely contracted for it. With this view he studied anatomy and medicine with his accustomed ardor, and though he did not then graduate in medicine, he acquired such extensive knowledge in these departments of science, as gained for him the respect and confidence of the medical profession, and fully entitled him to the honorary degrees conferred on him in later life, by the Jefferson College of Philadelphia, and the University of Maryland, each of which Institutions granted, without application on his part, an honorary diploma of Doctor of Medicine. So respectable was his knowledge of surgery considered, that during the attack by the British upon this city during the last war, his services were put in requisition as surgeon, and his kindness and skill were fully employed in caring for the wounded.

Dr. Hayden rose rapidly in public confidence. He became the companion of the most celebrated physicians and medical professors, who from time to time held the highest professional rank in this city. His opinions were listened to with respect, and his suggestions frequently adopted by them, and so high did he rank in professional estimation, that he was invited to read a course of lectures on dentistry to the medical class of the University, an honor never before or since, conferred upon a practitioner of dentistry. He contributed some valuable papers to medical journals, and entered with great zeal upon physiological researches, especially upon an investigation of the uses of the thyroid gland, which though they did not result in any important discovery, displayed great acuteness of mind, and experimental abilities.

Next to the study of physiology and pathology, Dr. Hayden was devoted to geological investigations. The success with which he examined the mineral peculiarities of this vicinity, are well known, and the discovery of the new mineral which bears his name, (Haydenite,) will always keep up the remembrance of his zeal and excellence in that beautiful department of physical science.

Unlike many who have become distinguished in this branch of study, Dr. H. was a firm believer in revealed religion; he had, as I have before remarked, a profound respect for the bible. Nothing would more readily draw from him indignant reprobation, than remarks which seemed derogatory to the majesty of christian truth. In all his geological inquiries, he never lost sight of the great fact, which many seem so ready to forget, that the earth did not make itself, but was made of God; and therefore Dr. H. solved difficulties by an exceedingly simple process, which to others were mountains in their path. An instance of his shorthand method of accounting for unaccountable things is afforded in the reply which he made to the objections of a scientific gentleman, who was in great perplexity to account for the formation of certain springs and water courses. It is strange, said the doctor, that one who believes that a wise Being made the earth, cannot admit that such a Being might exercise as much prudence and management as is evinced by a gardener who ditches his wet ground, and draws off the surplus water.

Having by the force of his own worth, attained distinguished professional consideration, Dr. H. was anxious to see a general improvement effected in the respectability of the dental art. The land was overrun with ignorant empirics who every where imposed upon the public and disgraced the name of dentist. The art was not regarded as a part of medicine. No schools were provided for instruction in it, and no evidence of qualification for practice could be procured; consequently, the public had no means of distinguishing the man of science from the man of brass, who under the name of dentistry, perpetrated mayhem and robbery, maiming and plundering, under color of dental practice.

Under these circumstances it was first necessary to unite the respectable dentists of the country in an association for the purpose of common effort, and mutual encouragement. This was effected by the formation of the American Society of Dental Surgeons, of which Dr. Hayden was chosen President; a journal was also established for the purpose of gathering and diffusing information on all subjects connected with dental surgery. In connexion with these movements it was thought advisable to establish a Dental College, which should consist partly of medical and

partly of dental practitioners, and which should afford those instruction in dental surgery, as a part of medical science, and grant diplomas of graduation to any who should be found worthy to receive such certificates.

Dr. H. did not originate these movements. To one younger, and hence more enthusiastic—one of your professors unfortunately absent from us, this honor is, in a great degree, due. But in Dr. H. Dr. Harris found a willing colaborer. At an age when other men are glad to shun labor, and especially to avoid new enterprises, Dr. H. entered with all the vehemence of his nature into these several schemes.

The amount of labor required of him as a professor was very great, for one who had already numbered threescore years and ten, nor did he avail himself of the indulgence which his age might well have claimed. He was not satisfied with such exertions as would have comported with his strength. He labored diligently and anxiously, too diligently and too anxiously in the discharge of his duty to his pupils. I need not tell you that he did not labor in vain. His lectures were rich in matter. He had read every thing that could throw light upon the healthy and diseased conditions of the dental structures, and, what was of more importance to his pupils, he had been a close observer and independent thinker for fifty years. The aggregate of the vast knowledge thus acquired from the labors of others, and more especially from his own, was comprehended in his lectures. He loved knowledge for its own sake, and studied nature from the force of that instinctive curiosity which is the animating principle of genius. Like Godman, he pursued truth with indefatigable patience, whether his curiosity was excited by the figure of a pebble, the motion of an insect, or the phenomena of disease. The pleasure of the investigation, and the satisfaction of the many questions which his own fertile mind would present, were all the rewards he asked.

The graphic line, once so aptly used to describe a remarkable character of old,

*"Nil actum credens dum quid superesset agendum,"*

might well be applied to our departed friend. He reckoned nothing done while any thing remained to be done. Hence, he was

ever active, looking upon acquisition as but preparatory to acquirement, and delighting in effort rather than in possession. Until overtaken by fatal illness, Dr. H. continued to practice and to lecture. There is much reason to fear that laborious bodily and mental exertion exhausted his little strength, and accelerated his death. When no longer able to leave his bed, his chief concern seemed to be for his pupils, who, he feared, would suffer serious loss from the interruption of his lessons. Even when delirium ensued, his mind was evidently busy upon his favorite topics. He would call for his class, and, supposing them to be present, would attempt to lecture. The ruling passion was strong in death,—to the last he talked of science.

Gentlemen, your venerable instructor, your friend, is no longer here. God, in his wisdom, has removed him hence.

"The languishing head is at rest,  
Its thinking and aching are o'er,  
His quiet immovable breast  
Is heaved by affliction no more;  
His heart is no longer the seat  
Of trouble and torturing pain,  
It ceases to flutter and beat,  
It never shall flutter again."

You will never again look upon his cheerful face and sparkling eye. You will never again hear his voice, discoursing to you of the wonders of organization, the wisdom of God, the pleasures of health, the cure of disease. But wherever you may wander from this scene of his useful life, let his memory go with you,—let it be dear to you,—let it be useful to you. Let his example urge you to exertion; not that you may attain to thorough knowledge of what is now dental science, but that you may add to that knowledge such discoveries and experience of your own as may vastly augment the common stock, and elevate dental surgery to a far more respectable rank than it now holds in the department of medicine.

Above all, let his memory abide with you, as the recollection of a christian man; of one whom *science* only established in the faith, and who loved revelation in the ratio that he was learned in the book of nature. Let it lead you to thorough confidence in that holy volume which only is the book of wisdom, as well as

the fountain of consolation, and let it remind you that wherever you are, under whatever circumstances you may be placed, the broad eye of God is fixed upon you, piercing into the depths of your heart, with as much intensity as though no other being trod the earth upon whom that eye could rest.

It is our humble, fervent prayer, that each one of you may so live beneath that searching look, that it may ever be your greatest happiness to know, "*Thou, God, seest me!*"

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## ARTICLE II.

*An Essay on the Morbid Effects of Diseased Teeth upon the Human System.* Read before the Virginia Society of Dental Surgeons, at their First Annual Meeting, October 11th, 1843, by W. W. H. THACKSTON, D. D. S., Fellow of the American Society of Dental Surgeons, of the Dental Society of Virginia, &c. &c. Published by order of the Society.

*Gentlemen of the Virginia Society of Dental Surgeons:*

HAVING been appointed to read an essay or dissertation, on some subject appertaining to the theory or practice of Dental Surgery, we have chosen the morbid effects of diseased teeth upon the human system, and the importance of their prompt removal, as a subject, perhaps, as well suited to the time and occasion, as any other upon which we could fix our attention.

When we remember the very intimate and extensive nervous connection which the dental apparatus sustains to the other parts of the system,—the various and multiplied sympathies incident to a diseased denture,—the exquisite local disturbance and pain, and the great constitutional derangement which such teeth occasion, it would appear almost a work of supererogation to say aught by way of impressing either practitioner or patient with the urgent necessity and importance of the extraction of all teeth, or remains of teeth, which are found to be beyond the pale of restorative treatment.

This, however, we regret to say, is not the case, and notwithstanding the advanced and improved condition of our science, the superior facilities for cultivating an intimate acquaintance with

correct pathological and therapeutical principles ; which refer as directly to the diseases of the organs now under consideration, as to any of the maladies to which the human system is exposed ; it is true, that a great majority of individuals will sooner incur the risk, and suffer the painful consequences of retaining such organs, than submit to the slight inconvenience and momentary suffering incident to their removal. But we are more pained to concede the fact, that there are now many, exercising the duties, and claiming the prerogatives and immunities of dental surgeons, who are too dark and ignorant to know or appreciate these truths, or who, knowing them, pusillanimously decline rendering that essential part of the service of the dental surgeon, because of the unpleasant nature of the operation, or a lack of confidence in their capacity for its performance, and that, too, often under the plea, that the presence of such organs will not only be harmless, but beneficial, in giving strength and support to the remaining healthy teeth, jaws, &c., and by awakening some of the prejudices and apprehensions, which every where exist with reference to the operation of extraction, they rarely fail to convince their patients, that however necessary and important this operation may be in some other instances, it is scarcely needful in their own.

From the foregoing considerations, we have been induced to make our selection, together with the hope that what we shall say may be of some avail, in correcting an error from which society has suffered much, and which has by no means enhanced the value and reputation of the profession to which you have devoted yourselves.

As the care of the teeth constitutes the chief purpose of our science, we will commence our essay by some reflections upon the injury inflicted on sound and healthy teeth, by the presence and proximity of diseased and dead organs of the same class. In the first place, we find such diseased organs most active and efficient agents in the propagation of disease to the remaining healthy teeth. And as there has been much diversity of opinion with reference to the pathology of caries, (the form of disease most common with the teeth,) we will here beg leave to digress for a moment, that we may make a few remarks upon this collateral subject.

This diversity of opinion has arisen from the conviction on the minds of several distinguished authors, that the immediate and exciting causes of this affection (caries) were *internal*, and the *development* of the disease *internal*; in other words, that decay always commenced in the interior structure of the tooth. Without going into a minute investigation of this question, we will simply observe, that after a most thorough and critical examination of the various agents and modes by which decay of the teeth is effected, their chemical characteristics and affinities, their physiological character and attributes; the question has been definitely settled, that the remote and predisposing causes of caries are *constitutional*, and the exciting, proximate and immediate causes *external*, its *development external*, and its character a chemical disorganization or decomposition of the dental structure, by the presence of an acrid and corrosive agent, which Dr. S. L. Mitchell, in a letter to Thos. Chas. Cope, M. D., of the University of Edinburgh, states (from a series of experiments instituted for the purpose of determining the character of this agent) to be the *septic* or *nitrous* acid.

As we have previously observed, several authors of merited distinction, (and of this number perhaps none more so than Thos. Bell,) have stoutly maintained the doctrine of internal causes, and decay of the teeth; but subsequent investigations and experiments have demonstrated its fallacy, and we will only remark, in conclusion of this part of our subject, that the views here advanced are entertained by nearly all dental pathologists of the present day.

But to return from this digression; with the foregoing established facts before us, we shall be at no loss to perceive that the presence of diseased teeth is a direct and immediate cause of caries: directly, by retaining in contact with the sound organs the destructive agent; and indirectly, by vitiating and corrupting the mucous and salivary secretions; the effect of which, unless corrected by the most vigilant attention to the cleanliness of the parts involved, together with the removal of the diseased organs, will be the entire or partial loss of the teeth, with the unpleasant calamitous consequences incident thereto.

These considerations, though of vital importance, are not para-

mount to others, which, in their order, we shall briefly enumerate : first, in the train of consequences, will come odontalgia, with its exquisite and intense local suffering, frequently protracted for days and months, depriving its unhappy victims of ease and repose by night, until the whole system is unstrung and broken down by exhaustion ; truly the Ayrshire bard has characterized it as the "*hell of all diseases.*" Alveolar abscess is one of the most common terminations of odontalgia from decayed teeth ; this being a formation of purulent matter about the *apices* of the fangs of the teeth, is retained until its quality becomes altered, and an acrid and corrosive character is imparted to it ; the surrounding osseous structure is soon softened, and broken down sufficiently to afford an outlet for the pent up matter, which then develops itself in what is usually denominated a "gum boil," or fistulous ulcer, most frequently discharging its contents into the mouth, thus corrupting the breath, vitiating the secretions, and impairing the functional operations of the digestive apparatus ; occasionally however, they develop themselves externally, and discharge through fistulous openings in the cheeks. Cases of this character, though not frequent, are by no means rare ; we have, in our own practice, encountered two ; in both instances, an inferior molaris and fang, which had been broken in an effort for its removal, were the exciting causes ; in each case, the most disgusting fistulous ulcers were formed, which discharged, constantly, though slowly, an intolerably *fetid* and very *acrid* secretion.

The removal of the offending teeth, with, in one instance, a piece of *necrosed* bone, together with attention to the cleanliness of the parts, constituted the curative treatment ; this course, we will here observe, is the only reliable one which can be adopted ; no plan of treatment will succeed while the diseased teeth are suffered to remain ; and we think we are safe in asserting, that in no instance will this plan fail, unless the state of the system be peculiarly unfavorable, or the case be of such long standing as that the edges of its duct or outlet have become callous ; in the first instance such constitutional treatment as is indicated must be adopted, together with the local means which we have already suggested ; in the latter, the removal of the hardened edges, with a narrow pointed bistoury, and drawing the wound together with adhesive straps, will generally effect a cure.



We will here, gentlemen, call your attention to the occurrence of *alveolar abscess*, *previous* to the moulting of the temporary or *deciduous* teeth; these teeth, it will be remembered, sustain not only the same nervous and vascular connection with the general system which the permanent ones do, but also an intimate *membranous* connection with the rudiments or pulps of the permanent set; and not only does this membranous union exist, but so crowded together are the fangs of the temporary, and pulps of the permanent sets, that in no case does any thing other than a thin spongy partition of bone separate them, and with the rudiments of the *bicuspid*es, which succeed the temporary *molars*, this separation scarcely exists, if it does at all, the fangs of the latter completely enclosing them.

It may then readily be perceived, inasmuch as we know that from the imperfect organization of the temporary teeth, and from the action of external causes, that they are as liable, if not more so, than the succeeding denture to decay and ache, and that the same local and general effects are produced in the one instance as in the other; that the occurrence of abscess in this instance cannot be too much dreaded, and remedies cannot be too promptly employed to arrest their disastrous consequences. The permanent teeth being in their embryo state, and directly exposed to the action of the acrid and corrosive matter thus secreted, are, if not wholly destroyed, (which, by the way, frequently occurs,) so much impaired as never to receive that perfect organization and development so essential to their beauty, utility, and preservation.

The practical deductions which we would here make are, that every means should be called in requisition to prevent the development of abscess from a diseased temporary tooth,—as the application of soothing drops to the exposed nerve, local and general depletion, cooling aperients, pediluvia, &c. &c. But if abscess forms, in despite of all efforts to the contrary, the offending tooth should be *promptly* and *unhesitatingly* removed; it may here properly be remarked, that this class of teeth (the deciduous) should never be prematurely removed, (lest a contraction of the maxillary arch be the result,) unless for this, or some other necessity equally urgent; in the present instance extraction should be adopted as the lesser of two evils.

Scurvy of the gums, as it is generally called, though an affec-

tion more frequently *symptomatic* than *idiopathic*, is, if not developed by the irritation produced by the presence of diseased teeth, at least always aggravated by that cause; the same remark will also apply to all the morbid changes and conditions which the soft parts of the mouth undergo, as preternatural and spongy growths of the gums, the occurrence of *simple, cartilaginous, osleo sarcomatous, cancerous* and other tumors. The predisposition and various characteristics which these affections assume, are dependant upon a *specific constitutional diathesis*; but their exciting and developing causes are generally local, and in almost all instances where those tumors and other diseased actions are found in the mouth, the local cause is ascertained to be an impaired condition of the teeth; it is, however, proper to observe, that the mouth, in common with other parts of the system, may become the seat of those several forms of disease, *without* the intervention of the aforementioned excitant, such cases are, however, comparatively rare.

The various forms of disease incident to the *maxillary sinus* are more frequently produced by the secondary irritation propagated from diseased teeth, than any other cause whatsoever; but as our views upon this subject have been given in another place,\* we will not here recapitulate them.

*Oxæna*, an ulcerous affection of the Schneiderian membrane, of a peculiarly unpleasant character, on account of its painful symptoms, and the intolerably fetid odor exhaled from it, is indebted, in many instances, for its existence, to an impaired denture; of this affection, Professor Harris has reported, in the Maryland Medical and Surgical Journal, a case accompanied with paroxysms of *neuralgia faciei*, which after resisting various forms of remedial treatment, including visits to several of our medicinal springs, was radically cured in a few weeks, by the extraction of a diseased *dens molaris*.

It not unfrequently happens that, through the medium of what is denominated sympathy, the teeth become most prolific sources of intense and agonizing pain; connected as they are by the union of the *pterygoid* branch of the *super maxillary*, with the first cervical ganglion of the *great sympathetic* nerve, a ready

\* See Journal of Dental Science, vol. 2, p. 227.

medium of communication is established between them and other and remote parts of the system, and often are they (the teeth) the unsuspected cause of the most aggravated and painful symptoms developed in those parts; and that, too, without the least pain or indication that would lead to the detection of the primarily affected organ; and, as a natural consequence, the treatment usually employed can at best be rarely more than palliative, while, in many instances, it doubtless contributes to the suffering of the patient. As a case of this character, Dr. Rush, in his "Medical Enquiries," mentions an instance in which rheumatism of the hip joint was produced by a decayed tooth, and which, resisting the ordinary remedies, alone yielded to its extraction.

*Neuralgia* may also be mentioned as in many instances having its origin in a defective denture; it, however, exists most commonly as a constitutional disease, caused, according to McCulloch and several other authors who have written upon the subject, by *miasmata*, *malarious exhalations*, &c. Mr. Bell is of opinion that this disease "may be divided into two distinct affections, distinct in their causes, and equally so in the effect which different remedies are found to exert upon them," the one produced by causes operating upon the system, and subject only to constitutional treatment,—the other dependant upon local causes, and, to almost the same extent, subject to local treatment. The distinguishing characteristics of those affections, according to Mr. Bell, (whose authority we consider, upon this subject, reliable,) is the regularity of the recurrence, &c. of the paroxysms in the constitutional form; while with the local affection the paroxysms are irregular in their recurrence, duration and degree of intensity.

This author details a number of cases of well marked *neuralgia*, of the local character, which, after the employment of constitutional remedies had failed to produce relief, or palliate the symptoms, were readily cured by the local treatment indicated. One of those cases we will transcribe, not because of any peculiarity which it possesses, for numbers of a similar character might be adduced, did we wish to swell our essay by their introduction.

"Mr. D., a gentleman aged about fifty, applied to me in consequence of a severe pain occurring in irregular paroxysms, first

attacking the ear, then darting down the neck and shoulders, through the entire length of the arm, so as considerably to diminish the power of the hands; he had been for more than a year the subject of this affection, and had latterly consulted a physician of the highest standing, who, finding the medical treatment which he recommended had failed to produce the slightest relief, requested me to see him. I was informed that the second inferior *molaris* had been broken, in an attempt to extract it, about two years before, the roots of which were now remaining in the jaw, the anterior one having been partially thrust out of the alveolus, and lying obliquely upon the gum, the posterior one still remained firmly fixed in its socket, but evidently exerting much irritation in the surrounding parts, with increased pain on pressure, which assumed somewhat the character of the paroxysms which he had so long suffered. I therefore removed both roots, and had the satisfaction of hearing in a few weeks, that the complaint had entirely ceased."

Two cases of a similar character, in almost every respect, to the one above quoted, have come under our own observation, and another was mentioned to us a few days since by a professional acquaintance; in each instance, the removal of a diseased tooth caused an immediate subsidence of the paroxysms.

*Ophthalmia*, *ear-ache* and *deafness* may be mentioned as common results of dental irritation; corroborative cases, in any number, might be here adduced, but as we do not wish to enlarge our paper with unnecessary matter, and as cases of this character are so common as to have come under the observation of almost every practitioner, we will pass on to the consideration of other diseased actions, induced by decayed and dead teeth.

*Hemicrania* is mentioned by Dr. Darwin, and observed by nearly every one of much experience, to be the result of dental irritation. Dr. D., in speaking of this affection, observes, "that it is attended with cold skin, and whatever may be the remote cause, the immediate one seems to be a want of stimulus, either of heat or distension, or some other unknown stimulus in the painful part, or in those with which it is associated. The membranes, in their natural state, are only irritable by distension, but in a diseased state they are sensible like muscular fibre;" hence, a diseased

tooth may render the neighboring membranes sensible, and is, doubtless, frequently the cause of this disease." Of *sympathetic headache*, he observes, "where this affection is confined to a defined part on the *parietal* bone, or on one side, it is generally termed *clavis hystericus*, and is always, I believe, owing to a diseased *dens molaris*."

In addition to the above, we will detail a case which occurred in our own practice: Mrs. C., a lady of strumous habit, had long suffered severe paroxysms of *hemicrania*, accompanied, sometimes, with copious *emesis*, from which symptoms it was inferred that the *stomach* was disordered, and that the paroxysms were sympathetic, and a course of treatment predicated upon this supposition instituted, which, as the stomach was sympathetically affected, resulted in but little benefit. Having occasion to consult me with reference to the condition of her teeth, one of those paroxysms occurred while they were being examined. I found them generally affected with caries, some having lost their crowns entirely, leaving their spiculated remains protruding through the gums, which were spongy and turgid; one of the inferior molar teeth had been broken in an effort at its extraction, and was left with a living nerve exposed to the irritating effects of pressure, hot and cold drinks, particles of food, &c.

I at once concluded that the cause of her complaint had been overlooked or mistaken, and unhesitatingly urged the removal of every tooth and fang which could not be restored to perfect health. My suggestions were readily concurred in; and, with the removal of the offending organs, all traces of the malady disappeared.

*Epilepsy, catalepsy, &c.* are often developed by an impaired condition of the teeth. Of the former of those affections, Dr. Rush mentions the following case: "Some time in the year 1801, I was consulted by the father of a young gentleman of Baltimore, who had been for some time affected with *epilepsy*. I inquired into the state of his teeth, and was informed that several of them were decayed; I directed their removal, and advised the young man afterwards to lose a few ounces of blood, at any time when he felt the premonitory symptoms of a recurrence of his fits. He followed my advice, and in consequence, I had lately the pleasure of hearing that he was perfectly cured."

Of *cataplexy*, perhaps one of the most interesting cases on record, both on account of the singularity of the phenomena developed, the length of its duration, the varied treatment to which it was subjected, and its sudden and unexpected termination on the extraction of a diseased *inferior molaris*, has been reported by Dr. Black of Virginia; and, but for its great length, we would with great pleasure transcribe it; suffice it, however, to say, that it was one of those formidable and mysterious cases which almost every physician, at some time or other, encounters, and which, to his disappointment and mortification, baffles every form of treatment which he is most likely to institute; and which have for their cause, and curative indication, nothing more than a decayed tooth, and its removal.

*Phrenitis* may be enumerated as one of the affections somewhat rarely produced by disordered teeth, but that a malady so formidable is *ever* produced by this cause, is sufficient reason that the fact should be noted and dwelt upon, that the danger of retaining such teeth may be properly estimated. Of this affection, from dental irritation, a most interesting and conclusive case is given in the Journal and Library of Dental Science, vol. 2, page 141, by J. E. Snodgrass, M. D. The considerable length of the article will prevent our presenting it in detail, but the material points we shall give you:

The subject, (who was the father of Dr. S.,) from imprudent exposure, suffered an *odontalgic* attack, in which several of his teeth participated; the inflammatory action gradually extended itself, until the jaw and left ear became involved, attended with a drumming of the latter organ, dizziness of the head, which rapidly ran into inflammation of the brain, attended with *delirium* and *coma*, in which state he died a few hours after his attack. In the language of Dr. S., "I have not the least doubt that odontalgia was the indirect cause of my father's sudden mortality, the ear-ache was doubtless *sympathetic*, while *phrenitis* was the *finale*."

The various diseased actions, growing out of an impaired and deranged condition of the *digestive apparatus*, are connected in an intimate degree, with the condition of the dental organism, and we hazard nothing in saying, that though the affections in question are not always dependent upon a morbid condition of the

teeth, they nevertheless often are, and by whatever other cause, they may be developed, the presence of such organs *never* fails, materially to aggravate them. In the process of assimilation, nothing is of greater importance, than that the food should be *perfectly* masticated, and that the *saliva* with which it is mixed, and by which it is fitted for deglutition and digestion, should be perfectly pure and healthy, otherwise the food is swallowed in an improper state, for with a diseased denture, it cannot be properly triturated; and the secretions being much vitiated, are both irritating to the mouth and nauseating to the stomach; the digestive organs thus having a two-fold duty to perform, the process is necessarily slow and painful, and as Prof. Harris justly remarks, "must necessarily weaken their powers and hasten their destruction." The immediate consequences of this imperfect mastication and insalivation, are *debility* to greater or less extent, sense of *oppression* in the region of the *stomach*, *nausea*, *sick headache*, &c., eventuating generally, in confirmed *dyspepsia*. We might cite a number of well authenticated cases of this character, but for reasons which we have previously stated, we shall, without farther remark, pass on to the last, in the catalogue of diseases, to which we shall particularly invite your attention on the present occasion, as having their origin in a diseased state of the teeth.

*Phthisis Pulmonalis*.—This appalling disease, in common with those to which we have already adverted, and others to which we might revert, were it compatible with the limits of our paper, is occasionally the melancholy consequence of the ignorance, or negligence of those who suffer their teeth to go to ruin, without an effort for their restoration, and who, from some silly apprehension, or ill-grounded prejudice, persist in retaining their irritating remains. We know that this declaration may startle some, nevertheless it is strictly true, and may be readily and rationally explained, by the extension of dental irritation, involving first the soft parts of the mouth, the *palate*, *tonsils*, *pharynx* and *glottis*, and lastly, the *trachea*, *bronchia*, &c. &c., and by the corruption of the air, which passes through the mouth during the process of respiration. But as facts form a more convincing species of evidence than even the most philosophical speculations, we will adduce cases of well marked pulmonary consumption; cases, which from their

symptoms, and the reputation of those under whose notice they came, and by whom they were reported, *cannot* be mistaken or doubted. We will, however, first introduce a just and eloquent passage, which occurs in the work of Dr. Fitch, on the subject of dental diseases, &c. This author, in treating upon the constitutional effects of diseased teeth and gums, observes, "that nature has formed the lungs most delicate and sensible, and susceptible to the slightest injurious impressions. She has also, finely tempered the atmosphere for its safe and healthy reception in those delicate organs; but art, accident or disease, may render it impure, unfit for respiration, and cause it instead of harmonizing with the lungs in the most perfect manner, and giving to them, and the whole system, health and strength, to be a baneful influence, armed with pestilence, scattering the seeds of disease over the lungs, and pouring the streams of deadly poison through every vein of the system."

We find in the excellent work of the author just quoted, the following case: "In February, Dr. Samuel Jackson, of this city, (Philadelphia,) called and requested me to see Mrs. R., who resided in Tenth, above Walnut street, who, he said, was laboring under every symptom of pulmonary consumption, and also appeared to suffer greatly from a diseased state of her mouth. I accordingly called on Mrs. R., and found the following to be her symptoms: great emaciation, hectic fever, almost constant cough, nearly a total loss of voice, articulation extremely difficult, as if speaking through a trumpet. Dr. Jackson said, that in a practice of seven years in the hospitals, alms houses, and private practice, he had never seen a case where a person recovered from the symptoms under which Mrs. R. laboured." I need not say that the Dr's practice was most extensive. The following was the condition of Mrs. R's mouth; about two years before, she had the upper wisdom tooth of the left side plugged, the filling being pounded in with a *mallet* and punch, by a dentist of this city; the fangs of the tooth converged so as to form a cone, and in hammering in the filling the socket was much injured; a chronic inflammation took place, which passed back over the *palate*, *half arches*, and some distance down the *œsophagus*, also over the *glottis*, *epiglottis* and *larynx*; it then passed over the right side



of the under jaw, and caused to inflame and slough away, all the sockets and teeth of the *inferior maxilla* but one, the left *dens sapientiæ*, which had not become affected when I was consulted. When I first saw Mrs. R., the process of inflammation, sloughing and gangrene, was at its height; extensive exfoliations of the jaw were taking place, and Dr. Jackson and myself concluded that the patient could not survive more than four weeks. The treatment of this case was as follows: I at once removed all of the teeth which were loose, and whose sockets were in a state of gangrene and exfoliation, likewise as much as possible of the necrosed bone, and directed a strong infusion of galls as a wash; in eighteen days the mouth became perfectly well, the amendment of her general health was surprisingly rapid; in five weeks she was able to take long walks in the streets, and in six months was restored to perfect health; nearly six years have since elapsed, and she continues in the enjoyment of excellent health."

This case, which differs in no material respect from many which have been reported, and which are almost daily occurring, speaks, in intonations which should sink deep into the minds of all who assume the responsibilities of the healing art, and especially those who have adopted that department which refers particularly to the diseases of the teeth and mouth.

It is sometimes objected against the extraction of such teeth as we have indicated, that they produce no pain, occasion no inconvenience; and why, in many instances exclaims the victim of his own folly, should I undergo the pain of having them removed? we would reply in the language of the great Dr. Rush, "when we consider how often the teeth, when decayed, are exposed to irritation from heat, and cold drinks, and aliments, from pressure, by mortification, and from the cold air, and how intricate the connexion of the mouth is with the whole system, I am disposed to believe that they are often the *unsuspected* cause of general, and particularly *nervous diseases*. When we add to the list of those diseases, the morbid effects of the acrid and putrid matter discharged from carious teeth, or from ulcers in the gums created by them, also the influence which both have in preventing perfect mastication, and the connection of that animal function with good health; I cannot help thinking, that our success in the treatment

of all chronic diseases would be very much promoted by an examination of the condition of the teeth, and by advising their extraction in every instance in which they are found to be decayed. It is *not* necessary that they should be attended with pain in order to produce disease, for splinters, tumors, and other irritants *often* bring on *diseases* and *death*, when they give no pain, and are the unsuspected causes of them. This transition of sensation, and motion to parts remote from the place where impressions are made, appears in many instances, and seems to depend upon an original law of the economy."\*

Dr. Koecker, in treating the same subject, holds the following language: "If these secondary local, and constitutional, affections, which are frequently mistaken for *primary* diseases, are treated *as such*, the symptomatic disorder will generally be much aggravated; those mistakes, are however, not surprising, when we consider the great difficulty there is in detecting the real and primary causes which are consequently, too frequently disregarded by the patient, and not unfrequently unperceived by the medical and surgical attendant. We cannot, therefore, too much bear in mind, that the *idiopathic* diseases of the mouth, even when in a very advanced state, *often* occasion the *least* pain in the part *primarily affected*; whereas the symptomatic disorders produced by them are *exceedingly* painful and alarming."†

We now beg leave to offer, in conclusion, a few reflections upon the facts which we have briefly presented. We find an impaired condition of the teeth, (we wish to be understood, as referring *only* to such teeth as cannot be restored to perfect health,) to be the occasion of much human suffering, the exciting agent of many human woes, of fearful and appalling maladies, the secret and destroying agent of many valuable lives; and all this injury and ruin affected by parts from which the unfortunate victims derive no benefit, which subserve no useful purpose, and which are retained only from an exaggerated idea of the pain experienced in their removal, or an unconsciousness of their imminent danger. Can the intelligent, then, be held blameless for persisting in this suicidal course? and will the physician or surgeon who fails to impress his

\* Med. Enquiries, vol 1, page 201.

† Koecker's Principles of Dental Surgery.

patients with the urgent necessity of attending to this part of the preservation of their health, discharge the high and responsible duties which he owes to himself, his profession, and above all, to the individual who confides to him the care of his health, and the preservation of his life?

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ARTICLE III.

*Hare-lip, and its Treatment.* By DR. S. P. HULLIHEN,  
Wheeling, Va.

HARE-LIP is the most common of all congenital deformities, and the most painfully offensive to the eye. This deformity may be divided into two varieties, the single and the double. The single consists in a division or fissure of the lip, corresponding, most generally, with one of the nostrils. The double differs only from the single in having two fissures, one corresponding with each nostril. A small portion of lip is therefore left hanging from the base of the septum nasi. This portion of lip is shorter and thinner than the lip on each side. The edges and angles of the lip, formed by the fissure, are always rounded, and this rounding comprehends the only loss of substance occasioned by the deformity. Both varieties of hare-lip are most frequently accompanied with a cleft or fissure extending through the alveolar arch, the roof of the mouth, and the soft palate. With this complication, the deformity is greatly increased; the nose is more or less drawn to one side, the nostril over the cleft in the jaw is spread out and depressed, and one end of the divided alveolar arch frequently projects forward, while the fissure in the lip is thrown wide apart, and the jaws and tongue are frightfully exposed, imparting a most hideous aspect. In such cases of hare-lip, the deformity may be greatly relieved, but not removed, unless operated upon at the most favorable period of life, and then only when the operation is preceded by proper preparatory treatment.

*The age most favorable for the operation.*—The most favorable age for the complete removal of the deformity of hare-lip, all concede to be in infancy; but there is some difference of opinion as to the time most proper for the operation during this period. It

has been urged by some writers, that the first four or five months, being before dentition usually commences, is the most proper time, as the child is then most easily managed, the deformity most effectually removed, and the constitutional effects of an operation less to be dreaded, than at any other period. This opinion, however, has been ably combatted, and by high authority, on the ground that young infants bear the loss of blood badly; that the pins are liable to tear out in the lip of so tender a subject; and that the consequent irritation, attending such an operation, often produces convulsions, and even death. They therefore contend that the most proper time for the operation is from one to three years after birth.

Fearful as these objections to early operations may appear, there is, in reality, no force in them when separately examined, and in connection with such preparatory treatment as most cases of hare-lip, in young infants, imperiously demand.

That an infant can sustain but a small loss of blood compared with an adult is an important fact, and one that should be most carefully remembered. But it is strange that this objection should be urged against operating on infants for the cure of hare-lip, when the bleeding in such cases is but trifling, and that, under such entire control! While the edges of the lip are being pared off, the pins inserted, and the ligatures applied, simple pressure upon the external maxillary arteries, or upon those of the lip, by seizing the lip between the thumb and finger, is all that is required to control the hæmorrhage to the most limited degree. If such simple but necessary precautions be neglected in operating, and the life of an infant be endangered or even destroyed from the loss of blood, the fault is surely not in the early operation, but in the manner of its performance. This objection, therefore, is of no valid import. That the lip of a young infant is tender, and that the pins may sometimes slough or tear out comparatively easy, when greatly stretched or dragged together over the projecting end of a cleft alveolar process, there can be no doubt. But if the division in the jaw be first closed, and its natural arch restored, the interspace in the lip would be so small that no such stretching or dragging together of the lip would be required, and sloughing or tearing out of the pins could not then of course occur.

If pins, therefore, slough or tear out in some bad cases of hare-lip in young infants, the fault must not be attributed to the tenderness of the lip, but to the want of proper preparatory treatment; a very important difference.

That local irritation is a common cause of convulsions in infants, is fully proved by their more frequent occurrence during dentition than at any other period of life; and that the irritation attending a great stretching or dragging together of the lip will likewise produce convulsions, in some infants, cannot be denied. Yet there is a grade of irritation necessary to produce these results, and that grade can only exist, in this operation, from too great a tension of the lip, and this tension from a cleft in the alveolar process, which cleft can always be closed before an operation should be performed, thereby removing at once the necessity of any tension, the source of irritation, and the cause of convulsions. The objections, then, to early operations in infants, for the cure of this deformity, appear to have been based on certain effects which were attributed, as shown, to wrong causes.

The operation on infants, for the cure of hare-lip, before the period of dentition has commenced, is more easily accomplished, presents more facilities for the complete removal of the deformity, and is less fraught with danger to the infant, and to the success of the operation, than at any other period.

The infant, before dentition commences, has no fears of an operation, and therefore makes no resistance nor struggles, except those excited by the painful manipulations of the operator; and these being but momentary, and the child easily managed, the lip can be more satisfactorily prepared, and elegantly adjusted, than can possibly be accomplished on a child a few more months advanced in life. This circumstance, alone, is of much importance.

The facilities for the more complete removal of the deformity of hare-lip before dentition commences, are very great and very important, where the deformity occurs in connection with a cleft in the alveolar and palatine arches. The bones of the face, at this period, being in a soft and cartilaginous state, can readily be brought into any desired position. The cleft in the alveolar arch can therefore be closed, its projections connected, its arch restored, which is as indispensably necessary to the complete removal

of the deformity, as a perfect adaptation of the lip. In addition to all this, nature makes a greater and more successful effort to restore all deficiencies at this period of life than at any other.

The operation before dentition commences, is likewise less fraught with danger to the infant and to the success of the operation than at any other period. Less fraught with danger to the infant, because the irritation consequent upon the operation can be rendered harmless, in all cases, by proper preparatory treatment; and because an infant is much less subject to convulsions before dentition, than after this process has commenced; neither is it liable to a host of other symptomatic diseases that so frequently accompany dentition, endangering and destroying life, independent of the consequences that might be added by the effects of an untimely operation. It is less dangerous to the success of an operation, because, at this time of life, an infant sleeps more than at any other, is less disposed to fret and cry, is less liable to disturb the lip and dressings with its hands, and is far more easily managed in every way that tends to the security and successful termination of a case.

I am, therefore, decidedly in favor of early operations on infants, for the cure of hare-lip. I have operated on thirteen cases before dentition had commenced, three infants of this number were only four weeks old; and I have yet to witness the first untoward event, or the slightest unfavorable indication resulting to an infant from the operation.

*Preparatory Treatment.*—Preparatory treatment is applicable in all cases of hare-lip during infancy, where the deformity is accompanied with a cleft of the alveolar and palatine arches. It consists in restoring the alveolar arch to its proper form, before the operation for the cure of hare-lip is attempted.

A cleft of the alveolar and palatine arches, like that of the lip, is a congenital separation of the parts, with but little if any loss of substance. Its connection, therefore, with hare-lip greatly increases the deformity of the whole countenance. The edges of the lip formed by the fissure are always carried apart as much farther than is usual in simple cases of hare-lip, as the cleft may be wide in the alveolar arch. The nostril over the cleft is likewise stretched out and depressed; a projection of the alveolar

process frequently occurs, and the face is always very perceptibly widened, all resulting from the cleft in the jaw, and all increasing or diminishing in deformity, in proportion as the cleft may vary in width.

To unite the edges of hare-lip, where this complication of the deformity exists, is always more or less difficult, and sometimes even impossible, and when accomplished will not restore the form of the nostril, correct the projections of the alveolar process, nor relieve the unseemly width of the face, except in a very limited degree. But closing the cleft in the alveolar arch corrects, at once, all these irregularities, and at the same time approximates the edges of the lip so closely that they may be most admirably united, without the least danger to the infant or to the success of the operation. It is upon these grounds that the utility and importance of preparatory treatment is urged.

The closure of the cleft in the alveolar arch may be effected in a variety of ways; but the most simple, and at the same time the most effectual, may be accomplished solely by the use of the adhesive strap, properly applied upon the cheeks.

The cartilaginous state of the bones in early infancy requires but little force to bring them into any desired position. But in removing the deformity of a cleft alveolar arch, a force of a two-fold nature is often required, both to bring the edges together and at the same time compress any projections of the alveolar process which may exist. In the proper application of the adhesive strap may be found this happy combination.

The form of the strap which I have usually employed for this purpose is represented in the following cut. It should be left as large at each end as the size of the cheek will permit, and slitted at different places, so that it may adhere smoothly and firmly. The part required to pass over the lip should be somewhat less than half an inch in width, the edges of this part being doubled over and fastened together, in order to give it the necessary strength and stiffness.

The strap may be applied in the following manner: after being properly warmed, one end should be quickly and well adhered to the cheek of one side, then, pressing both cheeks forward, and passing the strap over the upper lip, close to the nose, it should



be adhered in like manner to the cheek of the other side. By thus confining the cheeks forward, a force is obtained and exerted upon the jaw, sufficiently great to close in a few weeks the widest cleft of the alveolar arch, and at the same time to correct any projections of its process. The strap should be kept perfectly tense. It is therefore necessary to tighten it every day or two, which may be done by cutting a small portion out of the narrow part, and then sewing it together, without disturbing its adhesions to either cheek. In this way, the same strap will last for several days, and is so easily tightened that its management may be safely entrusted to the parents of the child. As the wearing of the strap never excoriates the parts, nor produces the least pain to the infant, however young, it is advisable to apply it as soon after birth as possible, as a cleft in the alveolar arch is more easily closed at this period than at any other; and as the strap is always of very great assistance to the infant in taking its food. In cases of simple hare-lip, without any cleft in the alveolar arch, the use of the strap will enable the child to nurse at the breast with but little if any difficulty.

In the summer of 1839, I was requested to see an infant that had been born a day or two before, with hare-lip, the fissure extending into the nostril, but without any deformity of the jaw. I immediately applied the strap, with the view of enabling the child to nurse at the breast, and the experiment was perfectly successful. The child could at once seize and retain the nipple in its mouth, and soon learned to suck without any difficulty. Since then, I never have had an opportunity of repeating the experiment, except on an infant that had previously acquired the habit of receiving its food, for a long time, from the spoon. In this case the result was entirely unsuccessful.

The time generally required to close a cleft of the alveolar arch, depends more upon the age of the infant than upon the size of the cleft. In the year 1838, M. H., of this city, requested me to see an infant of his, that had been born the night before, with a hare-lip, and the most extensive division of the alveolar and palatine arches, I ever witnessed. The cleft was nearly an inch



in width, causing such deformity of the face as such a division can only produce. I at once applied the strap, and by close attention to the case succeeded in bringing the edges of the alveolar process together, in three weeks from the time that the strap was first applied.

In another case where the child was nine months old, it required eight weeks to close a much smaller cleft. As this was the oldest child, I was ever called upon to treat, where the use of the strap would have been of the least advantage, I have no means of determining the length of time it would require to close a cleft in a child of one or two years of age. It generally requires from four to six weeks to close the cleft in infants under five months old.

As soon as the cleft edges of the alveolar arch, are brought together so as to touch each other in the slightest manner, the operation for the cure of hare-lip may be properly performed. The union of the lip in all such cases has the effect of completing the closure of the cleft in the alveolar arch. The treatment of the cleft in the roof of the mouth and soft palate, must now be abandoned, until the patient becomes more advanced in life, and may, perhaps, form the subject of some future paper.

*Operation for the Cure of Hare-lip.*—The general principles of the operation for the cure of hare-lip consist, first, in reducing the edges of the lip to a simple incised wound; then, in inserting the needles so that the edges of the wound may be brought evenly together; then, in confining the edges together until they are firmly healed. But, in addition to these general indications, a particular plan should be adopted in each operation, with the view of making a well formed lip, and this plan must be made with a strict reference to the peculiarities of the case, and be carefully and plainly marked out upon the lip before the operation is commenced.

The instruments necessary for the operation are, a scalpel, for detaching the lip from the jaw, a pair of dressing forceps to hold the lip, a pair of scissors or a bistoury, to pare off the edges, three or four long spear-pointed steel needles, several silk ligatures, a pair of cutting nippers to remove the ends of the needles, and a sponge or two.

The patient, if a child, may be first wrapped up in a long towel, so as to confine its legs and arms securely, and then be placed on a narrow table, in a reclining position, and firmly held by assistants, one of them making pressure upon its external maxillary arteries, just below and forward of the masseters. If an adult, the patient may be seated upon a chair.

The operation may be commenced by turning the lip upwards, and detaching it from the jaw, to such extent as the case may require. If the interspace in the lip is small, little or no dissection will be necessary; if large, a very free dissection is always required, extending along the jaw, and up under the wing of the nostril, (particularly if it is spread out and depressed,) until the detached parts give way sufficiently to permit the fissure of the lip to be easily closed, and the form of the nostril greatly improved. This part of the operation being finished, the next step is:

*To pare off the edges of the lip.*—This should be done in such a manner, that when brought together the lip will have a natural length, its hanging edge a proper form, and the mucous membrane covering this edge a corresponding width. To effect this, some cases may require one side of the lip to be pared off straight, and the other side concave. Sometimes both sides may be pared off straight; in other cases, both sides concave. In some cases, a broad portion of the lip may be removed on one side, and a very small portion from the other; but, in *all cases, as much of the lip as may be rounded* must be invariably removed. It is always better that too much of the lip should be taken away than too little.

Having determined upon a plan, and carefully drawn upon the lip the lines to be exactly followed in paring off the edges, the lip may be seized with a pair of forceps by the part to be removed, then putting it slightly on the stretch, the edges may be cut away as desired by a stroke or two with the scissors or bistoury, as the operator may prefer. As each edge is pared away, an assistant should control the bleeding, by laying hold of the lip, and compressing it between his thumb and finger. The edges of the lip being removed on both sides of the fissure, the next step is:

*To insert the needles.*—This should be done at equal distances, taking a sufficient hold of the lip to prevent them from tearing

out, and placing them in such a manner that the edges of the lip may be brought evenly together, both sides corresponding in every particular.

The lower needle should be always inserted first, and always in the red of the lip, and at least three lines back from the pared off edge. Then push it a little obliquely from below upwards, and from without inwards, until the point appears in the pared off edge, a little above the mucous membrane; then turn the point of the needle rather downwards, and introduce it into the other edge of the lip, precisely opposite the point where it came out first; then push it from above obliquely downwards and from within outwards, until the point appears in the red of the lip, as far back from the pared off edge as it may have been entered on the other side. A temporary ligature should now be thrown round the ends of the needle, and secured by a knot. The second needle should be inserted horizontally, and midway between the first needle and the nose, and much nearer the internal than the external surface of the lip. The third and last needle should be inserted as close to the nose as possible, and after the manner of the second. All the needles being inserted, the next step is :

*To apply the ligatures.*—This should be done so that the raw edges of the lip fit closely and neatly, without being pressed together unnecessarily tight. There is always as much danger of excessive suppuration about the needles, and of the needles sloughing out from too great a tightness of the ligatures, as from the greatest drag upon the lip, however wide the fissure may be.

The edges of the lip being properly fitted together, a short ligature may be thrown around the middle needle, and tied; then cutting away the temporary ligature from the lower needle, and adjusting the edges of the lip as they should be confined, a ligature of two feet in length may be passed round the ends of the needles, and carried backwards and forwards, crossing midway of each turn, until it is entirely consumed. A temporary ligature should then be thrown around the upper needle and secured, and the ligature on the middle needle cut away, and a long one applied in the same manner as that upon the lower needle; and then another, in like manner, upon the upper needle. All the ligatures being now applied, it only remains to cut off the ends of the needles close to the ligatures, and the operation will be finished.

No strips of adhesive plaster, nor bandages of any kind, should be applied over the lip, with the view of supporting it, until after the needles are removed. Such dressings always do more injury than benefit, by confining the secretions, and by their pressure upon the needles causing much unnecessary pain.

The needles may be removed the third or fourth day after the operation, depending entirely upon the amount of suppuration that may exist at the time, about the needles. The cheeks being held forward by an assistant, the upper needle may be seized with a pair of plyers, and after turning it round upon its axis, it should be slowly and gently withdrawn from the lip. Then removing the middle and lower needles in like manner, the assistant still holding the cheeks forward; an adhesive plaster should be applied in the same manner as described in the preparatory treatment, and in such a way as to prevent the slightest pull of the muscles upon the new adhesion of the lip. After four or five days the adhesion of the lip becomes sufficiently firm, and the wearing of the strap may be discontinued.

*The double hare-lip* should be treated upon the same principles in every respect, as the single. The only difference in the operation consists in cutting the small portion of lip that hangs in all these cases from the septum nasi, into a V, or wedge shape, so that it may be fitted neatly between the edges of the lip, in the upper part of the fissure. The lower and middle needles should always pass below this wedge-shaped portion, and the upper needle through it. In this way the lip may be brought evenly together and healed, the line of union having the appearance of the letter Y.

In both varieties of hare-lip, cases are frequently presented in adults, in which it becomes necessary to remove irregular teeth, and projections of the alveolar process, before an operation can be performed. In all such cases the arch of the jaw should be made as perfect as possible without any reference to the number of teeth or amount of bone it may be necessary to sacrifice in accomplishing this object. The bone nippers, saw, and tooth forceps, are the instruments usually employed in removing such deformities of the jaw.

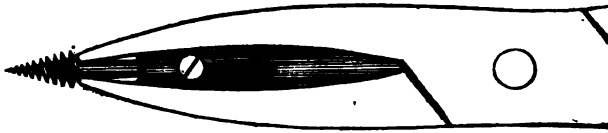
In curing hare-lip, it should always be the uncompromising aim of the operator, to remove the deformity as completely as possible, however tedious the process or difficult the operation may be, that is best calculated to effect the purpose. He that can be satisfied with any course of treatment short of this, should never do a patient the injustice to attempt the operation.

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ARTICLE IV.

*Compound Root Forceps.* By DR. S. P. HULLIHEN, Wheeling, Va.

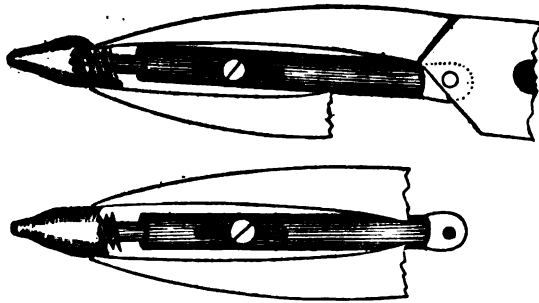
THE above named forceps were contrived some time since, for the purpose of extracting hollow roots of teeth, with more expedition and at the same time, with less pain to the patient than was possible with the instruments in general use, and as the forceps have fully answered the purpose for which they were intended, I have thought them of sufficient importance to lay them before the profession.



The Compound Root Forceps are about nine inches in length, and like the common straight forceps with the exception that the beak is much longer, and much narrower and thinner at the point. Lengthwise, within and between the blades of the beak is a steel tube, one end of which is open; the other solid and flat and jointed in a mortise in the male part of the forcep's joint. When the forceps are opened, this joint permits the tube to fall backwards and forwards from one blade of the beak to the other, without any lateral motion. Within this tube is a spiral spring which forces up a shaft—two thirds of the length of the shaft is rounded and fitted neatly into the tube, the other part is a well tapered or conical screw. The shaft is retained in the tube by a small screw, that is fixed into the shaft through a notch half an inch long in

one side of the tube. The shaft and tube are so fitted together, and to the beak of the forceps, that one half of the rounded part of the shaft projects beyond the end of the tube; so that the shaft may play up and down upon the spring the length of the notch, and the screw part projecting beyond the point of the forceps, so that the shaft may be embraced between its blades, just behind the base of the screw. A full sided view of the beak of the forceps with its tube and shaft is well represented in the several cuts.

The forceps are used, by first embracing the shaft between the blades. Then screwing it gently and as deeply into the root as possible, the blades are opened—pushed up upon the root, which is then seized in either of the ways as the case may require, represented in the annexed cuts.



The screw thus combined with the forceps, prevents the root from being crushed. It acts as a powerful lever when a lateral motion is given; it is likewise of advantage when a rotary motion is made—it prevents the forceps from slipping, or of their action being lost, should even one side of the root give way in the act of extracting it—and is used with equal advantage where one side of the root is entirely gone. In short, this combination of the screw and forceps forms an instrument which fulfils every indication that can be desired in the extraction of hollow roots.

The shaft of the Compound Root Forceps, is easily changed; a number of different sized screws may therefore be used in the same pair of forceps.

## ARTICLE V.

*Mineral Paste for Filling Teeth.*

MESSRS. EDITORS—I have recently seen several communications published, condemning the use of mineral paste in filling teeth. I am glad to see that some of the profession are determined to turn their faces against it. It has always been a matter of surprise to me, that any dentist should use it, especially when its component parts are known. I believe it is found by analysis, to be chiefly a compound of mercury and silver, no matter by what name it may be called. If it is true that these two things combined constitute "the mineral paste," no one need be surprised to find in some constitutions such malignant cases as were detailed by a member of the profession in the city of Baltimore, not long since. If the public generally could be made acquainted with a few such cases, it would require but little effort on the part of those who are resolved to discountenance its use, to put it down, and I know no better plan by which to do this, than to take a decided stand against it, in every shape and form.

I have never met with any one in my practice, who had had the paste used extensively, and I never saw a case where the result had proved so serious as in those above referred to; though I have met with many in which its injurious effects were pretty strongly marked. I presume that a person whose constitution is unimpaired by sickness, and who has no dormant mercurial medicines in the system, might have these paste fillings put in his teeth, without suffering such serious consequences, provided they were not very large or numerous. But if, on the other hand, the constitution has been injured, and the system impaired from the use of these mercurial medicines, I believe the introduction of these fillings could but produce a serious result. I do not know how much the digestive organs might be affected by the washings of such fillings, before it would be developed on the teeth and gums, or how much the whole system might suffer without giving a clue to the cause.

But suppose no actual injury could ever be traced to these fillings as the cause, still there remains an insuperable objection to their use. It is well known that all metals are subject to the

laws of expansion and contraction ; and although it requires but a slight heat to fuse the mineral paste, yet this heat must cause a slight expansion, and when this heat is expelled, a corresponding contraction must take place. It is well known, also, to dentists, that one important requisition in filling a tooth in such a manner as to arrest decay, is, that it must be so perfectly filled as to exclude even the moisture of the mouth ; so that the slightest contraction of the filling, after it is put into the tooth, would render it of no avail.

But if any or all of the objections which I have urged above, can be invalidated by the advocates of the royal paste, still practice is better than theory. Facts will show that mineral paste is not the thing to fill teeth with. I have, in the course of my practice, removed a large number of these fillings, after they had remained in for some time, and to the best of my recollection, I never removed one under which I did not find the tooth in a rapid state of decay, and the final loss of the tooth would have been certain if it had not been refilled.

About a year ago, a young man who resides in the south, called on me to operate on his teeth, a large number of which were badly decayed, two of which I perceived had been *filled* with mineral paste. He told me it was done by a *celebrated* dentist in New Orleans, and he was unwilling to have the fillings removed, and stated that they gave him no trouble, and he supposed that they were doing well. But when I insisted on their removal, and assured him that he would lose the teeth if he did not consent to it, he consented, and I proceeded to remove them ; and to his very great surprise I found about as much carious matter in the cavities as there was metal. Still the nerves of the teeth were not exposed. I ultimately filled these teeth permanently with gold, very much to the young man's satisfaction. I ought to remark, that in this case the two fillings adjoined each other, in the superior bicuspid of the right side, and that there was considerable inflammation in the gum. The inflammation very soon disappeared after the paste fillings were removed.

One other case I will mention, though I might mention many more : The Rev. Mr. —, who resided in Philadelphia at the time the celebrated Mallan was in this country, had several of



his teeth filled by that individual at that time, and kept the fillings in them until some time last fall, when he called on me and had one or two of them removed. One of the teeth, especially, had given him a good deal of trouble, and for some time he thought he would have the tooth removed. I removed the filling, however, and found much more carious matter under the filling than in the last case described. In this case the nerve had been destroyed, I suppose, by the process of decay under the filling. After removing the filling and a large portion of the carious matter, I let the cavity remain open for a few days, and the uneasiness gradually left it; I then filled the tooth thoroughly with gold, and I heard no more complaint from him about it.

In conclusion, I would only ask those who advocate the use of this paste in filling teeth, to remove one of these fillings—a large one—that has been in the tooth for one or two years; and if they do not become convinced that it is not the thing to fill teeth with, I think I might safely promise to yield the point.

S. M. SHEPHERD.

*Petersburg, Va. Feb., 1844.*

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#### ARTICLE VI.

*Address delivered before the Cincinnati Association of Dental Surgeons, February 2d, 1844. By M. ROGERS, M. D., President of the Society.*

DENTISTRY may be considered as a science, and as an art.

As a SCIENCE it teaches—the structure and uses of the human teeth, and the parts associated with them in the functions of mastication and speech.

It treats of the vicissitudes incident to the teeth in the progress of life, their natural wear and tear, the diseases peculiar to the teeth themselves, such diseases of the gums and other parts of the mouth as effect their beauty, usefulness and durability, of the direct and indirect effect of the diseases of other parts of the body upon the teeth.

As an ART it teaches the use and application of the means necessary to promote the healthful growth and regularity of the

teeth, the cure and precaution necessary to preserve their health and beauty. The treatment necessary to arrest decay when it attacks their substance, and for the cure of those diseases which waste and destroy those parts upon which they depend. It also teaches a thorough knowledge of those delicate chemical and mechanic arts necessary to enable the dentist to substitute and adapt with the most minute exactness, artificial structures to the mouth, to represent in perfection the living beauty of teeth that have been lost.

This definition of dentistry will suggest some idea of the *importance* of our profession and the deep interest that society have at stake in the character and ability of those who practise it.

I propose to devote this paper to the consideration:

Of the importance of the profession to which we belong.

The moral obligations resting upon those who practice it: and, to

Offer some hints upon the rules and principles that must govern the dentist to enable him to gain the confidence and patronage of an enlightened community.

To get a proper idea of the importance of our profession. It is well to inquire who are the subjects of it? It is not with us as with the profession of medicine, where the lame, the blind, the halt, the poor and the distressed in life, get the largest share of professional labor. Our principal business is performed for the most valued, the most useful, and the most beloved members of society.

The importance of our profession is shown by the great value of the teeth and how indispensable they are to comfort and happiness. The proper mastication of the food is so important a link in the process of digestion, that if this, the first preparation of the aliment, is improperly performed, dyspepsia is very liable to be induced, a disease most difficult to cure after the teeth have been lost. I need not dwell upon the numberless concomitant evils which may owe their origin to imperfect mastication.

We are called next to contemplate the importance of the teeth as they stand connected with the grand prerogative of man—the GIFT of SPEECH. The teeth are absolutely necessary to perfect articulation, and to the modulations of the voice. Their preserva-

tion is therefore essential to all persons who do not exclude themselves from society.

For what can be more disagreeable than the mumbling conversation of those who have lost their teeth.

To all public speakers, teeth real or artificial are a "*sine qua non*," without them the graces of eloquence are lost.

It would be well if all persons could be impressed with these facts before it is too late, as it would prove one of the strongest inducements to bestow upon the teeth the care necessary to their preservation.

We come next to contemplate the teeth as an element of beauty. And here they must ever stand pre-eminent.

No regularity of features, brilliancy of complexion, sparkling of eyes, or braids of jetty hair, can render a lady beautiful, who, when she opens her lips, discloses a set of teeth irregular or discolored.

A mouth large and ill-formed, will pass very agreeably if it contains teeth beautifully white and even. In short, good teeth, well kept, will prove a redeeming feature to the face, even if the others be indifferent.

On the other hand, the effects of decay, the presence of tartar, the blackened fangs, the taint of the breath, always accompanying such a state of the mouth, is both loathsome and disgusting. A face ever so finely formed, with the elements of beauty interwoven in every lineament, is absolutely painful to look upon, if it has in the foreground, a mutilated set of teeth.

A voice set by nature in the sweetest tones of melody, as if intended only to put forth those sounds, and utter those sentiments that delight the ear, and captivate the heart, how uninteresting and painful it becomes by the lisping and halting occasioned by the loss of teeth.

The value set upon these beautiful organs by that sex, to whom, man with all his boasted independence, looks for the centre and foundation of his earthly happiness, for whose smiles we labour, and for whose favor we repine, I say the value which they set upon these beautiful organs must always form a crowning argument for the importance of that *art*, which has power to preserve from decay, and ensure their beauty and utility through life.

That well regulated dentistry has this power, we all believe, and let us all here stop and resolve, that *it shall always have this power* while confided to us. It will be well for society if it does, and a fearful responsibility rests upon us if it does not. My friends, shall this beautiful, smiling, hoping young daughter, doted upon by her father, worshipped and idolized by her mother, and beloved by every body, shall she be mutilated in our hands; a principal element in her beauty taken away, trifled with, and destroyed by her dentist? Let him who would do such a thing, be execrated and pointed at till he find his proper place in or out of society. Let not a liberal profession be disgraced by the man, who, for want of skill, or through negligence would, or could perpetrate such an evil upon a confiding fellow-being.

The enlightened part of society understand well, the importance of dentistry, and they are willing to pay us well if we will do our duty faithfully, and they may also be willing to pay *him well* in coin that he may not relish, who, through ignorance or neglect of duty, betrays their confidence. I say again, let us resolve to be faithful.

The great delicacy of the organs which we are called to treat, their exquisite sensibility, and the great influence which their diseased condition exerts upon the rest of the system, shows the importance of our profession; and it gives, too, some little hint of the circle of science which an accomplished dentist must attain, to make him master of, or qualify him for its successful practice.

It will be well for society when the practitioner in this branch of surgery, shall be compelled by law, and what is still better, by public sentiment, to be a graduate of a medical college before he is allowed to assume the responsibilities of our noble profession. We are not consulted merely to prepare a cosmetic, a wash, or a powder, to adorn and beautify the teeth, or give a grateful perfume to the breath: our duties lie much higher than this.

We are often called upon to determine whether these beloved members of society shall have teeth of their own, or be subject to all the pain and mortification which attends the loss of one of the chief elements of beauty and comfort for the rest of their lives, and be liable to be in the power of the very man whose ignorance and mismanagement has thus mutilated their persons.

Our profession being one of the liberal and scientific, places the practitioner in a conspicuous situation in society, and lays him under strong moral obligations to sustain the character and dignity awarded by society, to members of the learned professions. We are morally bound as individuals, and as brethren having a common interest to maintain, and mutual duties to perform to each other, to cultivate the kindest fraternal feelings. Let our social intercourse be regulated by that gentlemanly courtesy characteristic of an elevated mind, actuated by generous feelings and a conscientious regard to duty. Without maintaining such an intercourse, we are in danger of lowering our profession in the estimation of society, and gaining for ourselves little else beside ridicule and contempt.

The necessity of strictly adhering to these rules, when our patients or others are disposed to question the character and ability of a brother, or even when they have a just cause of complaint, is very manifest.

From what cause it arises, I do not pretend to say, but we are often called upon to listen to long complaints against the practice and management of a professional brother. We are thus placed in a very critical and a very trying situation. In these circumstances, my friends, I know of but one rule that a man can pursue and keep in the path of duty, viz. "to do unto others as you would wish them to do unto you." It is the only rule that applies in the case, and it is a safe one. I hope there is not an individual in the sound of my voice that will ever do otherwise. In such a case, we are bound by every consideration to conciliate feelings, to explain mistakes as far as we are able, and do every thing that an honest man can do to protect a brother from unmerited injury. I say *unmerited*, for I have rarely met with a case of the kind where the complainer did not do more or less injustice by suspicions or misapprehensions of the case, or the motive of the practitioner.

Community is full of those who seem to delight in fault-finding, and there are others who are honest, perhaps, in their intentions, but who never seem to have a correct idea of anything, and they are the very ones who talk the most, and are always the most confident.

Now, my brethren, we shall all have to take our share in these things; there is not one present, whose reputation for the time being, may not be entirely in the hands of a brother under such circumstances.

If we join with such a person, and allow a feeling of envy or jealousy to govern or influence us, we may, indeed, injure a rival, or gratify a private pique, but do we look a little further and see that upon cool reflection, the very person we encouraged will despise us, while on the other hand, if we spoke of our brother's faults with gentlemanly caution or regret, set the good points of his character in view, and in a word, showed sorrow and regret at the thought of our profession suffering in the person of any of its members; I put it to any one, would not such a course command a respect, would it not indicate a christian spirit, and would not even the detractor himself feel more safe in the hands of such a man? "Virtue, indeed, carries with it its own reward."

Then let us keep in mind the high moral obligations that rest upon us, as practitioners, as men, and as christians; do every thing in our power to elevate the character of our brethren, individually, and by that means lay deeper the basis of our own.

The generous confidence which our patients manifest, by placing interests so dear to them, in our power, increases our moral responsibility; it is one from which we cannot escape. Then let us make ourselves worthy of such confidence by the ability and moral integrity of men, not only skilled in the mysteries of their profession, but whose hearts and principles of action are formed and fashioned by our Saviour's golden rule.

Shall we destroy our neighbor's teeth, endanger his health, and take his money too? All this is easily done, aye, often done by a careless performance of our duty. We have many temptations to contend with just now, and one which besets us almost every day, is the very honest one perhaps on the part of our employers, of wishing to get their work done cheap.

People have not yet learned that cheap dentistry is as plenty as any other cheap thing, and worth about as much in comparison. But my friends, let me warn you against temptations to sell cheap dentistry. By dealing honestly and faithfully with those who do not suspect that cheap dentistry is among the dearest things on earth,

we may give them advice most valuable, which will prevent them from again annoying us by trying to beat down our prices. People are not always to blame for wishing to get their teeth operated on for a reasonable price, or for wishing to know your price beforehand, because our profession has been disgraced and outraged by those who had no other rule to regulate their charges, than to be sure and get all the money they can from every one that employs them.

It is our duty to disabuse ourselves and our profession from this charge, and impress upon the mind of every one, that we have a fixed and unvarying standard of prices, and convince them that our standard is the reasonable and strictly just one, to charge just as much as we fairly ought to have and no more, and of charging that uniformly, and also of rendering our services honestly and faithfully at all times. I say let us *convince* every one that we are governed strictly by these rules, and we shall soon find that we are saved this most trying and vexatious annoyance of being jewed in our prices. I am greatly mistaken if a truly capable man will not find a reasonable support in this community; he has only to make himself *capable* and *worthy* of support to get it. That man who will lower his prices to suit the tastes or prejudices of his patients, will always be sure of getting two things, one of which will be, the distrust of his patients, and the other necessarily must be, a practice not worth having.

There are two things positively and unconditionally necessary to success in business, to wit:—capability and moral honesty. Without these a man could as well navigate a ship without a compass or a rudder, as to expect continued success in an enlightened community. To be honest we must have a correct and an unvarying rule of action, and what is of equal importance to our success, we must act so as to let the public know we have it. Little tricks and deceptions covertly practiced, may do in some kinds of business, but it will not do in ours. We are public characters, and as such our professional conduct must be strictly honest, open and decided at all times. Our responsibilities are so great, that society will not let our acts pass without strict scrutiny.

When the fond parent places his child under our treatment, he

pays the highest compliment in his power, to our professional ability. What does he merit in return? Is it not the best skill and service of which the profession is capable? Do we always give it? Have we it always to give? If not are we morally honest? Are we capable?

These questions come home to heart and conscience, and they ought ever to be there while we practice dentistry.

I have been sixteen years a practitioner in Cincinnati; I have always found this community generous and confiding, and I always believed the little success that I have met with, was owing more to an open, candid course of conduct, than to any other cause; I never fail to recommend the same to others, on all suitable occasions.

With regard to capability, I have one word to say, and the first is, *look to your books*. They contain the principles of science upon which dentistry is founded. But do not think, after you have read Bell, Fitch, Koecker, Maury, &c., all of them good and practical writers on our noble art, that you have all that the books contain on the subject of dentistry, or enough to make you capable, in any reasonable sense of the term. They have only the upper works; the foundation lies entirely below them.

We need a knowledge of chemistry, to teach us the laws that direct even our mechanical operations, much more the great laws that govern the physical properties of these beautiful, these sensitive organs, so especially entrusted to our care. We need anatomy, to teach us their structure, and the structure of those parts of the body upon which they depend. We need physiology, to teach us the laws of life that govern, direct, and *make* these delicate sensibilities. We need pathology, to teach the phenomena of the diseases of the organs we are called to treat. We need a most thorough knowledge of the principles and practice of surgery, as the finishing and crowning part of our professional character.

My friends, society expects all this of the man who assumes the character and pretensions of a DENTAL SURGEON. They expect him, also, to be a gentleman and an honest man.

In conclusion, for the student to be fitted for the practice of dentistry, it is essential that he should cultivate not only his



intellectual and mechanical powers, but he must cultivate the heart and conscience, till he is actuated by an elevated and refined standard of moral principle and feeling, that shall govern all his intercourse with his fellow men.

United with industry and prudence, such a standard, faithfully followed, will secure ample pecuniary support, gain the affectionate confidence of society, and make him an ornament to his profession.

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ARTICLE VII.

*Letter from C. L. NORTON, Dentist of New York, to the Baltimore Editor.*

*New York, Dec. 20th 1843.*

DEAR SIR:—I herewith send you a tooth extracted by me on the 11th inst. As you will observe, it is a good specimen of an injected tooth, caused by inflammatory action. This tooth when first extracted was of a tolerably bright red color, throughout nearly the whole extent of its bony structure; at the extreme point of the root, however, it had retained its natural healthy appearance. During the few days it has been in my possession, it has faded considerably, and probably in time will nearly or quite resume its natural color.

Instances of this kind so rarely occur, that I have thought it not amiss to give a brief history of this case, hoping it may not be altogether uninteresting. The facts, then, are as follows:

A young woman of about twenty years of age, a servant in my employ, requested me to examine a tooth, which she said was somewhat painful. This was about six weeks since. On examination I found the tooth considerably decayed, but the internal or nerve cavity not yet exposed; I, at this time, removed a portion of the decay, but the tooth being exceedingly sensitive, I could not prepare it fully to receive a filling. I applied to it a small portion of *arsenic*, and two days after, prepared and filled the cavity with *tin*. At the time of filling, the soreness had entirely disappeared, the tooth was firm in its socket, and to all ap-

pearance in a healthy and proper state to receive a plug. The operation of plugging was performed with great care, guarding against pressure in such a manner as to compress the *nerve* or injure the *periosteum*. The tooth thus filled continued healthy and useful for about four weeks. At the end of this time, however, it became painful and extremely sore to the touch, and the patient suffered intensely with it for some three days before I was informed of the fact. I then examined the tooth, found the periosteum and neighboring gum to be very highly inflamed, the latter excoriated, the tooth discolored and of a reddish aspect. From the appearance of the gum, I supposed the patient had endeavored to relieve herself from the pain by the application of some *tooth-ache remedy*, and charged her with it; she however stoutly denied the charge, but acknowledged that she had "picked it with a pin."

Convinced of the impracticability, if not of the impossibility of reducing the inflammation and thereby saving the tooth, and encouraged also by the fact that it could be very well spared, (it being a *dens sapientiæ*, and as the remaining teeth were in a sound and perfect state, she having previously lost but one, and that the corresponding one of the opposite side to this which I herewith enclose,) I extracted it, and found it to be as you see, a good specimen of an "injected tooth."

It may not be out of place here to remark that this is another added to the many incontestible proofs of the vascularity of the teeth, and of their being endowed with vessels of circulation, notwithstanding the opinions of the great Hunter, and other eminent anatomists. But as this is a matter so generally conceded by all well informed practitioners of the present day, I will not enlarge upon it, but content myself with propounding a few inquiries. And,

*First.* Did inflammation, in this instance, proceed from the pressure of the filling upon the thin plate of bone covering the internal pulp, and thereby compressing and irritating that substance? Or,

*Second.* Did the dose of *arsenic* produce the inflammation, by being taken up by the vessels, and conveyed to the nerve through the intervening plate of bone? Or,

*Third.* Was the inflammation induced by the external irritation of the gum and periosteum, by "picking at it with a pin," (or the application of some other substance,) and which might have irritated the gum as the appearance indicated; and if so, did the internal membrane sympathize? And,

*Fourth.* In intense inflammation of the *periosteum*, is it possible for the vessels of circulation of the tooth to become distended and surcharged with red blood to such a degree as to give to its whole bony structure the appearance of a perfectly injected substance, without the aid or sympathy of the vessels occupying the internal cavity; or must *both these vessels* and the *periosteum* be highly inflamed at the *same time*, to produce this effect?

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#### ARTICLE VIII.

*Tartar, or Calculus of the Mouth.* Translated from the French of DELLABARRE, by \* A \*

TARTAR, stone, or *odontolithos*, is a calculous substance that collects upon the teeth. Various analyses have been made of it, both by French and foreign chemists; but every analysis given of it, has necessarily differed from another, because the tartar thus analyzed, was taken from subjects of different temperaments, of which circumstance the analyzers appear to have taken no account. This stony substance, however, is far from being of the same nature and containing the same principles in all individuals; thus, for example, the black dry tartar which is found in small quantities around the necks of the teeth of persons having a good constitution, dissolves with difficulty in muriatic acid. The yellow, dry tartar of persons called bilious, dissolves much more readily, while the white, soft tartar of mucous temperaments, scarcely at all soluble in the acids, is readily dissolved in the alkalis. This last contains a great proportion of fibrin, but the others have more of the terreous basis. Exact and comparative analyses of the different sorts of *odontolithos*, are yet to be made, and I do not doubt that great difference will be found to exist between them. Though chemists should have taken every precaution that

could have rendered their labors of utility to the physician, there still would remain a question to be discussed which is infinitely of more importance to the physiologist. It consists in the solution of the following problem :

Whence proceeds the calculus of the mouth ? Is it, as some have said, a secretion ? Is it a deposit, as has been repeated again and again, of the saliva, as stated in every medical work that has appeared for centuries ? or, is it not rather a diseased terreous exhalation of the mucous membranes of the gums ?

Jourdain and some others have supposed, that the small glands scattered over the periosteum of the teeth, secrete the tartar. Gariot simply observes, that it comes from the gums ; but a late author announces that he has discovered some *dental glands*, which should more properly be called *calculars* : as if nature had furnished a system for this noxious formation. But is not this author too hasty in supposing their existence ? The small glands that he thus designates, may perhaps belong to the mucous and salivary systems, for the saliva, as all physiologists know, is not furnished by the parotid glands alone, but also by a great number of calculous kennels, which are very observable in ruminating animals, distributed over different parts of the mucous membrane of the mouth. I therefore think that this is a gratuitous supposition on the part of this author, because children of a very early age, are not affected with tartar, and it is on them that he thinks he has discovered the glands which produce it. Did these really exist, they would instead of decreasing, augment in volume, as age advanced, and their functions being more and more established, they would be very large in old persons and those who are subject to tartar. Now there is nothing to lead us to suppose their existence in these individuals. To suppose, therefore, that organs without functions may be very large, which, when they have them, cannot be discovered, is contrary to sound physiology ; were we to do so in this case, the *dental glands* of the author, would be wholly different from all others, which are the more decided the more they are in action. This supposition being inadmissible, I do not believe in the existence of these glands, which I have patiently searched for, but in vain.

Notwithstanding the opinion of some surgeon dentists-experi-

mentalists, the most accredited hypothesis in the formation of odontolithos, is, that the terreous salts contained in the saliva are precipitated by a chemical agent, and gradually deposited on the teeth, where they are agglutinated by means of the mucus of the mouth.

This supposition is admitted by the English dentist, Fox, and is generally followed without examination by most of our modern elementary works; it is, say they, by analogous means, that the calculi of the bladder, the kidneys, the gall vesicle, &c., are formed;\* but has this interesting point of physiology and pathology, been considered in every point of view? Calculi are found not only in cavities designed to serve as reservoirs for certain fluids; but they are also met with in the stomach and intestines of some animals, in the articulations of gouty persons, in the peranchyma of the liver and lungs, in the thickness of the muscles, and finally in the brain itself, where they have been mistaken for osseous portions of its substance.†

It is, nevertheless, worthy of remark, that the mucous membranes, as well as the sinovial glands and those that furnish the mucus are more especially liable to the production of concretions. Thus they are frequently found in the tonsils or amygdales, in the nose, the maxillary sinus, the external auditory conduit, the articulations, &c., whence it appears to me more natural to suppose them to be the product of an accidental exhalation of the sanguinary capillaries, to which the mucous and sinovial systems are much disposed.

Veterinary physic furnishes us with proofs to the point of what I have advanced. M. Duhuy, professor of the veterinary establishment, of Alfort, has demonstrated that the mucous membranes of certain animals are subject to a disorder that he calls tuberculous, which consists in the formation of a fine gravel that is found in the thickest parts of their tissue, and whose analysis gives almost the same products as the other stones.

Surely these sorts of concretions as well as those that are

\* Vide Researches on the causes of Gravel by Magendie, 1818. The Dictionary of Medical Sciences, and an Essay on the Chemical History and Medical Treatment of Calculous Disorders.—London.

† Vide the Anatomy of the Brain, by Dr. Gall.

found either in the nose, or in the maxillary sinus, &c., can only come from a diseased exhalation of the membranes, *since there is not in these places, any other fluid than the mucus; and even it remains there but a short time.*

In the same manner the exhalents of the gums appear to me to furnish tartar; they give out more or less of it, according as the gums are healthy or inflamed; the blood that penetrates their capillaries contains more or less calculous earth. This is a remark, to which I have often called the attention of my pupils that have been present, on my visit to the orphan asylum, or at my private consultations. When the gums are diseased, they are covered with a whitish layer, which is soft at first, but gradually collects upon the teeth, where it hardens. When they are not inflamed they do not produce it, so that we sometimes observe the teeth on one whole side of the mouth, where the gums are very sound, not having a particle of calculus on them, while on the opposite side where inflammation does exist, there is a considerable quantity of it, yet the saliva bathes the whole of this cavity. This observation may easily be made: 1st, in children that are changing their teeth; because on the side where the molting is going on, their gums are more or less irritated. 2d, On a person who habitually has no tartar on his teeth, but who being attacked with a fluxion in only one of his cheeks, is affected with a catarrh in the mucous membrane of the mouth. The side affected presents a viscous saliva or gums covered with slime; whilst on the other side there is nothing of the sort. If we remove the cheek with a spoon, and observe the oozing of the saliva, we shall find, it is true, that it flows in greater abundance than usual, but yet is very limpid. 3d, If we examine the saliva that comes immediately from the parotid, without having entered the mouth, but diffuses itself over the cheek because of a fistula in the conduit of the gland, we shall see it fall drop by drop, without being viscid: if we then collect and analyze a portion of it, we shall find that there is no calcareous phosphate in it, but, if from the same subject, we take the saliva of the mouth, we shall discover that it is more or less mucus, and that the terreous salts are the more abundant the greater the proportion of mucus. 4th, The conduits of stenson were removed from a horse,\* in order to obtain:

\* An experiment made at the Veterinary establishment, at Alfort.

the fluid which is secreted by the glands, and on its being analyzed, no calcareous earth was found. Concretions in the conduits of this animal are frequently found; they consequently must be the product of an exhalation from the mucous membrane that lines the conduits, and not a deposite of the saliva which passes over them.

I have in general observed, that in such a state of health as the subject is usually in, whatever may be his age or temperament, the quantity of calculus, is in direct ratio to the proportion and consistence of the mucus. It is also in an increased ratio to his strength.\* Thus for example, the saliva of a good constitution, and in the vigor of youth, has an affinity for atmospheric air, with which it mixes, so as to become frothy; it floats on the top of distilled water, and soon mingles with it; there is little or no tartar on the teeth; but as soon as disease or age has weakened him, his saliva becomes mucus, floats below the surface of distilled water, does not mix with it, and frequently sinks to the bottom. There is also a greater or less quantity of tartar in different parts of the mouth. The principal and quantities of the mucous portion of the saliva vary with the state of health according to age and temperament; hence it happens, that the calculus of the mouth is presented under different aspects; sometimes it appears in great abundance, as a sort of slime; at one time it constitutes a very hard and blackish body, at another, it collects in thick yellow crusts.

The analysis of the odontolithos should consequently give results differing according to physical character. This is the case with other calculi, which always contain materials depending on locality. Thus uric acid is found in those of the bladder, while the fluids of the adipose vesicle, are odorous by reason of the *debris* of vegetable matter which they contain, &c.

I have frequently observed, that when the mucous membrane of the gums, irritated by some local or general cause, has become inflamed, and the resolution has become imperfect, these results are atonic obstruction, the gums continue swollen, and discharge

\* I mean by this, the natural strength of each individual accidentally increased or diminished.

with facility, a red purple blood; and, although they, before they were in this state, gave but little tartar, yet now they supply a good deal. Here the formation of the tartar is occasioned by a chronic catarrhal affection of the membrane of the mouth, which must be subdued: 1st, by removing tartar and paying daily care to cleanliness: 2d, by resolute and sometimes acidulated gargles, and finally by spirituous and astringent tonics; but if these means are not sufficient to restore energy to the vessels of the gums, which are afflicted with a species of debility, the embrocability of their tissue is destroyed, the calculous matter spreads over them, the dental periosteum dries up, purulent matter oozes out between the gums and teeth, which causes them to fall out by excavation, although they are perfectly sound.

Accidental or acute inflammation of the gums very easily passes to the chronic state in persons who delay to have it reduced. To effect its reduction, we are sometimes obliged to have recourse to various therapeutic means, and, though we cannot expect to prevent entirely, the formation of tartar, yet we may very much diminish its quantity; to this end, repeated purges and venications are, when properly employed, infallible means: I have frequently ordered them and have obtained success, even after the fluxions had passed to the state of catarrh. It was, therefore, not without pleasure, that I read in the second article of an analysis, of an essay on the chemical history and medical treatment of calculous diseases by M. Marcet, a physician of London, that he had made the same remark in regard to the vesicular calculi.\* Here the purgation acts by removing the seat of irritation.

When we reflect that persons most subject to odontolithos have foul tongues, in the morning before eating, must we not believe that this disposition is generally throughout the whole extent of the intestinal membrane, and that these temperaments are very improperly called bilious? Do not the affections that are peculiar to them rather depend on a disposition of the mucous mem-

\* See the Journal edited by M. M. Bechard, Magendie, vol. 1, p. 375.



branes, which more or less abundantly secrete this yellow filth that closely resembles soft tartar, and contains much mucilage?\*

From what I have just said, the formation of tartar may depend either on an idiosyncrasy of the gums, a local irritation, a general weakness of the solids, or finally on a superabundance of earth in the fluids. The true cause, therefore, can be known, not by a superficial examination of some parts of the gum, but by a close inspection of every part of the mouth. The tartar that is the result of local inflammation, generally encrusts, only on a few of the teeth, it is hard, and the gums are sound in every part where it is not present; it is found on teeth that become painful in consequence of inflammation in the periosteum. That which depends on an idiosyncrasy is spread over the whole mouth, and may be of considerable consistence; that which is deposited in consequence of general weakness of the vessels is small in quantity, white or yellow in color, and thickly impregnated with mucus. The gum is swollen, soft, and slimy, such as we observe in persons attacked with scorbutus. That which results from a superabundance of earth in the humors, is frequently dry and hard, it concretes upon all the teeth, and is thickly packed upon the gums, causing them to swell but not depriving them of their firmness. This last sort is found on aged persons and those of a bilious temperament; in the greater number of instances, the tongue is continually covered with a foul yellowish coat.

Men are not alike subject to calculus of the mouth, in all climates of the globe. In general, the travellers that I have consulted on this subject, have assured me, that in Asia, Africa, and in all those regions, where the heat is great, the teeth are good and but little affected with tartar. The same is the case in elevated and temperate countries; but in places that are cold, marshy and subject to fogs, the mouth easily contracts a catarrhal affection, which produces much filth. But without extending our

\* We may be assured of the truth of what I have advanced, by a very simple experiment, which consists in collecting the filth for a fortnight, with a tongue scraper, and placing it in a glass of water; we must decant the water every morning and pour in fresh. It will then form at the bottom of the vessel a yellow or greasy precipitate, having all the characteristics of tartar.

observations so far, do we not find, that the gay inhabitants of Provence, generally need but little assistance from the dentist, while in the western parts of France, such as Havre, Dieppe, &c. there are multitudes whose teeth are bad and thickly encrusted with tartar.

As it regards age, children generally have but little tartar, unless they are in a bad state of health.

Adults have more of it, especially after having passed their thirtieth year, and advance towards old age.

It is in the last periods of life, that the mouth presents the largest quantity of it, because then, the calcareous earth, that abounds in our humors, becoming superfluous, exudes by means of the exhalents from the mucous membranes and the skin.

As to temperament, persons of a sanguinous temperament have but a small quantity of tartar, those of mucous, much ; those of a bilious, more ; and its chemical and physical characteristics vary in each.

The relative state of health in each temperament also causes the proportion of tartar to vary ; and the physician will profit by the remark ; for the more abundant formation of tartar, where there is no local inflammation capable of determining it, is a consequence of a weakness in the solids of the subject ; whence a change in the qualities of the fluids results.

If we turn our attention to the bladder, in order to study by analogy the formation of stones, we shall be led to apply the same principles ; when we remove a sound that has remained for some length of time in this cavity, we frequently find it covered with a calculous incrustation at different points, although the patient has never experienced any thing announcing a disposition to gravel. In my medical practice, I have had frequent opportunities to observe such cases, and a very remarkable one is recorded in the Journal of *Sidillot* for July, 1818, which gives an account of a soldier in good health, in whom a sound was employed, to prevent the obstruction of the urinary canal. Having been neglected, it remained in the bladder for seventy-nine days ; at the end of which time it was resolved that the operation of lithotomy should be performed, in order to remove a calculus that was attached to it, and which prevented it from being with-

Were the kidneys destined by nature not only to secrete the urine, but also to separate from the blood the terreous salts which are discovered when an analysis is made of the urine that comes from the bladder, the operation of lithotomy would only be a means of affording momentary relief to the patient, but could not radically cure the disease, for, scarcely would the calculus be removed, and the wound cicatrised, before the urine would deposit anew the calculous matter, so that it would be necessary either to operate once a year, or every six months, or to keep the patient under a severe and slightly nutritive regimen, to which few would submit, and which, indeed, they could not endure.

It appears to me, therefore, that all the various petrifications that are met with in so many different tissues of the economy, indicate a mode of formation independent of all prior suspension of calcareous earth in a fluid, and subsequent precipitation thence, by a chemical action. I accordingly suppose, that the saline materials contained in the article blood, penetrate, in consequence of a chronic local affection, into the capillaries of the different systems, whose exhalent mouths allow them to exude.

I will here terminate these observations by remarking that the opinion which I have for a long time entertained in relation to the mode of formation of calculi in general, appears to me to be very like that of Hunter's, which may perhaps give it some weight. This celebrated surgeon also intends to compose a special work on this subject, but if he has ever published such a one, I have never been able to procure it.

Although the ideas that I have just thrown out, have their origin in my intimate conviction of their truth, as regards the calculus of the mouth, and although they differ from those of physiologists, after whom M. Magendie, in France, and M. Marcet, in England, have published two very good treatises, the former, on gravel, and the latter, on visicular calculi. I would, nevertheless, observe, that the means which they point out to prevent or cure calculous diseases, would also be those to which we should be obliged to resort, to prevent the formation of tartar, did we not possess the advantage of being able to apply, to the mucous membrane of the mouth, the local remedies proper to oppose its accumulation. Finally, every regimen tending to diminish the

quantity of terreous salts that enter into the composition of our bodies, will be a preservative from odontolithos, as well as from the other calculi.

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ARTICLE IX.

*The Apparel destined by Nature for the Absorption of the Roots of the Temporary Teeth.* Translated from the French of DELABARRE. By \* A. \*

If the teeth of man grew as their possessors gradually increased, like what is observed in some species of fish, a second dentition would have been necessary; but this is not the case; the temporary teeth having acquired their dimensions, do not continue to increase any longer, whilst, on the contrary, the jaws of the fœtus are extended by reason of the general development of the individual. These provisional teeth, that have at first lain obliquely in the fœtal jaws, which then were ranged so agreeably to the alveolar edges of the infant, and which, until the second or third year, are placed very near each other, commence about this period to become perfectly separated. This result of the increase of the maxillary circle soon calls for stronger teeth—teeth that may afford less fragile means to perform mastication. Consequently the teeth that have been silently growing behind the primitive ones, gradually announce their presence by moving there, which finally yield and give place to them. This singular phenomenon, at first unknown, has been explained in various ways; and the moulting of the teeth is still, to those who see only mechanical causes, a problem that they cannot solve. Formerly, very celebrated anatomists wrote, that the milk teeth were without roots: this error has been shared and repeated by their cotemporary dentists, who, probably, did not think proper to assure themselves of the fact. Yet the simplest dissection of a child's jaw would have dispensed with these useless commentaries. It is not more than fifty years since this question was decided, and the truth known; but where it still remained to be resolved, it was remarked by some, if the milk teeth have roots, how happens it, that, when they fall out, we do not find them? Instead of

making anatomical researches, they formerly conjectured that the root, just as the horn of the stag, falls from the head that bore it, and that then the root gave birth to a new tooth.

Bunon, having made several preparations to assist him to understand the subject, and having acknowledged that the temporary and permanent teeth were perfectly independent of each other, endeavors to explain this destruction of the roots of the teeth.

This author supposed that the heat of the parts increased the action of second dentition; and the pressure which he thinks must be exerted by the crown of the permanent tooth upon the root of the temporary, were the causes of its destruction; he moreover conjectures, that it was either entirely consumed by the heat of the parts, or carried away by the saliva.

Fauchard combats this opinion, not believing, with reason, in this mechanical pressure, but supposing that this destruction results from a proper disposition of the juices of the temporary root, or from the action of the surrounding liquors.\*

L'Ecluse, in 1764, pretended that the dental vessels do not any longer convey the juices to the milk teeth, whenever those of replacement have attained a certain degree of development; and hence, according to this writer, it follows that these small roots are broken by a sort of maceration.

Jourdain attributes the destruction of the roots of these teeth, and of the inter-alveolar partition, to several causes: 1st. To the pressure which he supposes to be exerted by the tooth of replacement. 2d. From the mechanism he adopts, he admits, with Fauchard, that the osseous juices which are carried to the milk teeth by *particular vessels*, overflow in the temporary teeth, acquire then a certain acrimony, changing its color, altering its substance, disposing it to decomposition as if it were injected with an acid, and that, finally, the residuum of this dissolution disappears without any one's knowing by what means.

All these explanations could not convince Bourdet, who believes that the destruction of the temporary roots could not be effected by the means mentioned by these authors; and he was the first to observe that, at the time of moulting a temporary tooth, we

\* Bichat has shared this opinion.

always find behind it a carneous tubercle which served as a sort of niter medial between the crown of the tooth of replacement and the root of the tooth to be replaced, so that all immediate contact was impossible. He thence concludes that this small tubercle exudes an acid juice, with the property of acting upon the temporary root that is nearest it. M. Laforque, having also remarked this small fungoid body, and supposing it to possess the function assigned it by Bourdet, designates it by the name of absorbing apparel. This, in effect, is to suppose a carneous tubercle being gradually developed before the tooth, whose progression it precedes, that continually augments in volume, and appears to consume not only the temporary root, but every thing that would oppose the march of the tooth; if it is not, what other organ is charged to do this?

Surely the increase of the osseous channel, that I have called the *Inter Dentis*, [alveolo-dental canal,] and the destruction of parts so compact as the temporary teeth and the maxillary bones, can only be effected by one of those phenomena placed under the influence of life.

We have shown, in a preceding chapter,\* that the disposition of the crowns of the teeth within the alveoli is such, that there is never any contact between them and the surrounding parts, and that, consequently, there is no pressure. There is not, moreover, any arterial pulsation capable of destroying the neighboring organs, such as sometimes happens in the vicinity of large vessels, or of aneurism. We cannot, then, admit that the destruction of the temporary roots can only result from a friction of which we have demonstrated the utter impossibility.

We cannot, moreover, believe in the exuding of stagnant acid juice, for the presence of such a chemical agent would not only act upon the tooth that should be destroyed, but would also most indubitably cause inflammation, followed by suppuration and caries. Nature, always so provident, is bound to provide against such accidents; she sometimes, it is true, envelopes her simplest operations in a veil that at first appears mysterious, but which is soon drawn aside by physiological discoveries and exact research.

\* The author here refers to another part of the work, from which this translation is made.—*Balt. Ed.*

On the subject of the destruction of the temporary roots, Hunter, in his Natural History of the Teeth, thus explains himself:—"It is very natural to suppose that this [wasting] was owing to a constant pressure from the rising teeth against the fangs or sockets of the first set; but it is not so, for the new alveoli raise with the new teeth, and the old alveoli decay in proportion as the fangs of the old teeth decay, and when the first set falls out, the succeeding teeth are so far from having destroyed, by their pressure, the parts against which they might be supposed to push, that they are still enclosed and covered by a complete bony socket. From this we see the change is not produced by a mechanical pressure, but is a particular process in the animal economy."

Fox believes that the destruction of the temporary teeth results from a pressure that is exerted by the permanent tooth upon the alveolus, and upon the root of the tooth that should yield it place. The mechanism adopted by this author, though not the true one, is still very ingenious. We will see what he says upon the subject:

"It has been observed that the pulps of the new teeth are placed behind the temporary ones, and in that situation they are very much crowded, and occupy but a small space. Now it is evident that as they advance in growth, they will require an increase of room, to obtain which, they must come forward, so as to form a larger circle."

"This effort first produces a considerable pressure against the bony partition placed between the temporary and permanent teeth, and upon the posterior part of the fangs of the shedding teeth. The pressure in this instance acts precisely in the same manner as it generally does in other cases where it is applied. It induces an absorption of the parts pressed against; and as the new teeth augment, the fore part of the socket which was formed around the pulp, and separated it from the temporary tooth, is removed by the process of absorption."

Thus we see this fungiform body has not been observed by Fox, and that his system, ingenious as it is, must of itself fall to pieces, when we carefully dissect the jaws of an infant of six or more years. Has M. Serres solved the problem in his *Nouvelle Theorie de la Dentition*? This author has promised to explain

how the roots of the milk teeth are *worn away*, and he thus acquits himself: "The osseous intercalary is opened from the bottom to the top by a *usure*\*—a slow destruction, resulting from a primordial law, of which no one can assign the natural cause."

This explanation is almost literally translated from Hunter. A little further on, he adds: "The roots of the temporary teeth are worn away by the same law that destroys the alveolar partition." Finally, he supposes a vacuum is formed by the destruction of the temporary root.

The science has gained nothing from these plausible hypotheses. If M. Serres had given himself the trouble to read the works of Bourdet and of M. M. Duval and Laforque, he would have seen that this law has established an organ, whose existence and functions have been conjectured by these learned dentists.

It is certain that there is not only a law, but also an agent charged by it to effect the destruction of every thing that would form an obstacle to *odontocie*, (dentition;) this agent would not have been so long unknown, if physiologists, instead of employing themselves in vain reasonings, had sought to interrogate nature about the fact. For scarcely has first *odontocie* been accomplished, when second dentition, at once, prepares all its forces to destroy that under the cover of which it is developed. While the crown of the tooth of replacement is only in formation, the exterior membrane of the matrice is simply crossed by some blood vessels; but as soon as it is completed, the capillaries are then developed in a very peculiar manner, and from a tissue as fine as cobweb; from this time the internal membrane, instead of continuing to be very delicate and of a pale red color, increases in thickness, and assumes a redder hue.

As was before said, it is at the instant in which commences the reaction of the coats of the matrice, that are conveyed from the gum to the neck of the tooth, that the plaiting of the vessels that enter into their tissue, compose a body of a carneous appearance, whose absorbents extend their empire over all the surrounding parts; it is, therefore, the dental matrice itself, that, after being dilated to serve as a protecting envelope to the tooth, is contracted not only to form this bud-like body which we find

\* Waring.



immediately below the milk tooth, at the instant in which it naturally falls out, and whose volume is necessarily augmented as odontocie gradually goes on; but also a carneous mass by which the whole crown is surrounded, whose thickness is the more remarkable as the organ that it envelopes is nearer its orifice.

Is there, then, a dissolving fluid exhaled from this, that acts chemically on the surrounding parts, or do the absorbents, without any intermedial, destroy every thing that would obstruct the shooting up of the tooth? Not possessing positive proof, suitable to guide me in the decision of this question, and finding those of others of little importance, I will not attempt to answer them.

The vessels of the temporary tooth frequently remain entire, in the midst of the destroying apparel by which they are surrounded. They continue to convey the juices to the central part of the tooth, whilst the calcareous phosphate and gelatin have been taken away from round about them. Sometimes they are found strangled or even destroyed.

The natural moulting of the temporary teeth generally happens when almost all the root has been destroyed, but frequently not until the interior of the crown is hollowed out in the form of a capsule; nevertheless, diseases of the gums may determine its moulting, without there ever having been any absorption. Thus, whether the absorbents of the fungiform tubercle, by a sort of suction, pump the calcareous phosphate and gelatin from the temporary root, without any previous disposition, or whether an exhaled fluid effects this decomposition, they are both carried back in to the general torrent of the circulation, conformably to the law of vital decomposition.\*

The vessels charged with this operation are more decided in the place that borders on the temporary root. When they are very red, as if inflamed, life, in fine, strikes with reiterated strokes, employs all its energy, and destroys every thing that forms an obstacle to the passage of the organ that replaces the one whose destruction has been determined on.

Force for the performance of certain phenomena, increases in

\* Recent experiments made by Dr. Magendie at Paris, and M. Mayer at Beme, prove that absorption is peculiar to the veins, and render doubtful, according to these authors, that of the lymphatics.

the ratio of the resistance; hence the absorbing body is more decided as the parts to be destroyed are thicker or more solid; for the same reason, too, it is found to be very powerful behind a milk molar, that is about to be moulted, and whose strong roots have been entirely consumed. There is not, therefore, any vacuum occasioned by the destruction of the deciduous root, as has been gratuitously supposed by a modern author, for the volume of the apparel is in direct ratio to the destruction effected, and the progress of the tooth. Nor is there any of the *detritus* remaining in the alveolus as Bunon remarks. The root of the tooth is absorbed in the same manner as all the parts that are touched either by the fungi-form tubercle that proceeds, or the body of the matrice itself.

There cannot be any abrasion of the temporary root by the crown of the permanent tooth, since there is no friction, this last being separated by the matrix from every thing that environs it, even until it has passed the aperture of the *Iter Dentis*. As soon as the crown of the temporary tooth falls out, we perceive that the permanent, which does not delay to be elevated to the same level as that which has preceded it. The dental matrix having passed through different states, and having fulfilled the functions that were assigned it, is effaced and leaves no other trace of its past existence than those two small eminences that delineate the festoons of the gums. If there is no room for the immediate action of the absorbing apparel upon the temporary root, which happens either when the teeth of replacement has not followed the *Iter Dentis*, or when the child is feeble, its destruction is not effected, and it may remain in its place during the whole period of life, though the permanent tooth sprout up not far from it.

The absorption of the root may sometimes occur, although the permanent tooth is still at a distance from it, but then the action that is performed, has wholly preceded *odontocie*; this is a new proof that it is not any mechanical action that determines the moulting of the teeth. Hunter and Fox have also noticed this fact. Thus the latter has avowed his embarrassment in explaining absorption as the result of pressure.

There is in my possession a curious piece of anatomy, it consists of a large second molaris of the upper jaw, between whose

roots a *dens sapientiæ* is developed. The destruction of the roots has been effected in the same way as they are in the milk teeth; the *Iter Dentis* passes between them. This very rare fact proves that the annihilation of the roots of the teeth, may occur not only in the temporary, but also, all that are submitted to the action of the *absorbing apparel*. Thus it sometimes happens, that a temporary tooth, situated near that which should be replaced, is found to be partially destroyed by the fungi-form body destined to destroy its neighbor; so that the two milk teeth drop out together to be replaced by only one; an irregularity in the adult teeth may result from this, for when the other tooth is about to sprout out, finding its place occupied, it oftentimes deviates to the interior or exterior side.

If the development of the apparel is imperfect, or if the appendage of the sac has been destroyed by an injudicious operation, the tooth frequently remains imbedded in the alveolus and does not sprout. I have now in my possession the jaws of an adult, in the substance of which the *dens sapientiæ* still continue enclosed.

Immediate contact between the temporary and tooth of replacement cannot exist, when the last is enclosed in the maxillary bone, but it very frequently occurs, while it is encased in the exterior aperture of the *Iter Dentis*, when the tooth that should have been moulted, is found disordered, and in such a case the destruction of the temporary root is found imperfect, which would not be, were the mere contact the cause of the *usure* or absorption.

M. Duval, always so judicious an observer, has also made similar remarks.

I have seen many cases in which a last molar being found directed towards its neighbor, after their formation, has determined a sensible depression on the crown of this tooth, but its enamel was not at all altered, and its thickness was the same as all its other parts.

There nevertheless is a method of absorption that depends on a diseased affection, which is frequently met with in the practice of surgery; as when a bullet having remained several years in the thickness of the cellular tissue, presents numerous proofs that the capillaries are found to alter their economy. I also know a person from whom two superior incisors were extracted on ac-

count of decay, and whose places were then filled by two others that had an instant before been taken from a young man; these teeth maintained their places for two or three years, after which the alveolar absorbents consumed these stronger guests, small imposthumes upon the gums followed and the teeth fell out—their roots having been reduced to osseous fillets, which presented a thousand asperities.

Fox has represented a similar case.

I have performed upon myself, and also upon several other persons, an analagous operation, which consists in extracting a diseased tooth, removing its soft central parts, filling it with gold, shortening its extremity, and then replacing it; after five years, this tooth is now as solid as the others;\* still, I do not doubt that it will one day end in its being separated from the jaw, for it frequently occasions me very acute local pain, and aggravates the rheumatism to which I am subject. This neuralgia always commences at the tooth and then spreads itself over the whole side of the head; so that I frequently repent having replaced it.

I have extracted teeth that had become very loose, in consequence of inflammation of the periosteum, whose alveolus had acquired a supernatural capacity from the sole action of the absorbing vessels, since there had not been any caries. The periosteum was budlike, very thick, and resembled the fungi-form body that destroys the roots of the primitive teeth. But absorption of this sort is the result of a local disease, determined by the presence of a noisome body in the midst of the parts that it irritates, and which endeavor to dislodge it. This they do, in consequence of the inflammation and pain which give each other mutual support. The first is the instrument, with which life is provided to effect the expulsion, the second calls upon the patient to seek speedier relief.

Nature, in order to open a passage for the molars which are

\* It does not enter into the plan of this work to give my sentiments respecting these sorts of engrafted animals. I have tried various experiments with them, which I will describe at another time, and from which I have concluded that the teeth placed in the alveoli, after having been extracted, acquire a sort of vegetable existence by means of a periosteum or false membrane that is developed and holds them in their places.

situated immediately below the gums, and separated from them only by the lamina of bone penetrated by a large orifice, alike accords them the aid of absorption, and the organ charged to perform it, is remarkable for its breadth and thickness. It wears away the gums as well as the maxillary bone, but especially opposite each tubercle of the tooth ; but this body does not possess the redness of those which consume the primitive teeth.

If the absorbents are developed with energy, anteriorly, the the tooth of replacement, that was at first behind, is carried to the side, and the partition which separates it from the temporary is soon destroyed. It is placed immediately below this last, and sometimes ends by pressing beyond it.

Whilst it executes this movement, the posterior lamina of the jaw is gradually brought to meet the anterior, which appears very much to aid the progression of the tooth towards the side. The approach of the two maxillary osseous lamina is very appreciable when we compare the jaws of children of different ages. As soon as a part of the crown of a tooth is engaged in the buccal aperture of the dental matrix, the glutinous liquid, that we have said is therein contained, gradually flows into the mouth. It is probable that when the internal membrane touches the tooth, the contact increases still more the contractile action of this envelope, for the small bone enclosed by it, is then, in a few weeks, raised above the gums, while it has required many years to gain their level.

Although the absorbing apparel be well developed, still, if the *Iter Dentis* is situated too much within the mouth, not only does *the tooth destined to follow its* direction, shoot up without the circle, but also the temporary root either cannot receive any taint, or, as I have before observed, the neighboring temporary will be destroyed, whilst the one that should have been removed remains untouched.

No one, not even the slave of his own laws, can suppose that nature never deviates from the mechanism I have described ; the tooth, it is true, in the greater number of instances, follows the natural route ; but it is not rigorously subject to it. If the absorbing apparel is developed with too much energy on the anterior part, every thing that is found placed before it is rapidly destroyed ; thus the inter-alveolar partition, the root of the temporary tooth,

the compact anterior lamina of the jaws, and even the gum that covers it, are alike consumed, so that the point of the tooth, instead of following the canal of the appendage, opens for itself an artificial passage, by piercing either laterally or anteriorly the small matrix. It shows itself very low in the jaw, and below the level of the temporaries, if it is in the inferior jaw; or very high, and above the same teeth, if it is in the superior. These phenomena may from time to time be observed in the bicuspidati, but more frequently still in the conoids. I, for a long time, believed that the deviation of the *Iter Dentis* could alone occasion *gag teeth*; but anatomical examinations have convinced me that I was in error. Still *gag teeth* are gradually brought into the circle unless some mechanical obstacle opposes them, as, for example, the presence of the temporary teeth, the striking of the anterior teeth, &c. &c. Finally, they are a long while in accomplishing this movement, and it is frequently necessary to determine it by the aid of art.

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#### ARTICLE X.

##### *Quackery.*

This term has usually been restricted to the professions of divinity, medicine and law, but we find by tracing it more narrowly, that it reaches every art, trade and occupation, and in a still more enlarged and comprehensive sense, that it embraces the whole being of man, as comprised under that of his physical, intellectual, and moral nature.

Hypocrisy, imposture, bold, daring, unblushing pretensions, without any just claims—mid-day robbery on the temple of science, by stealing her mantle and wearing it without license—*modestly* telling the people at the same time, in trumpet tongue, that it is truly genuine, and demonstrating thereby, most infallibly, that its roughish possessor has all the popular essentials of surpassing skill and success.

In a word, all shallow and clamorous pretensions, under whatever name they may appear, and however plausible they may seem, come strictly under the head of quackery—a term expres-

sive on the one hand, of complete destitution—an entire waste, in all the essentials of worth in reference to qualifications for practice in the particular profession or branch of business pursued—and on the other, denoting the positive possession of an exterior covering to deceive the credulous,—being as it is, a most glossy effrontery, assurance and charlatanism, thereby committing a more unpardonable outrage on all the sacred rights of humanity, truth and decency.

Intellect, morals and religion, form the three-fold cord—the only solid foundation, from and on which all that is really useful to mankind must be drawn and reared—and by which, also, every thing that pretends to be useful and good, must be infallibly tested and exposed.

This, in a word, is the rock of truth—whether in science or art—every thing, therefore, coming in collision with this touchstone, if true, will naturally glide into and become part and parcel of this fundamental rock of truth—being as it is of the same essential nature; while on the other hand, all that is false, when coming in contact with it, will be as certainly repulsed and dashed to pieces—for having no affinity with it—no right to any part or parcel in this rock of blessings, but doomed as an outcast from this holy habitation, and condemned, yea, justly condemned, both as the enemy of truth and mankind.

This rock we have said, is constituted of *intellect, morals and religion*.

The three go hand in hand—they are inseparably and harmoniously blended—though it may be in different degrees—but the whole, nevertheless, forming the most perfect unity in the individual who has reduced them to practical cultivation—and it is the disjunction of one or more of these essential elements—the taking of one and rejecting the other, instead of taking the whole as the absolute and indispensable condition; we say, we believe this to be the true source of all the quackery in the land; for, intellect grasps at the facts before it, weighs them carefully in the scales of the judgment, and thus acquaints itself with their applicability and utility. Morals, or the duty we owe to our fellow men, point out the road that intellect should take in the practical application of its knowledge, which is the benefit of mankind—

while religion comes in, backs both intellect and morals—binds the two more strongly together, and thus form, by their conjoint action, that rock of truth which has the good of mankind, individually and collectively, and good only in its most sacred keeping and dispensing. While if intellect *alone* pretends to be the whole truth and dispenses as such, leaving out morals and religion, we find self the predominant thing, and the good of mankind entirely lost sight of,—and we have thus formed a quack, who, by being destitute of moral principle, is only rendered by his shrewdness and intelligence a still more dangerous person in society, and still more capable of gulling the credulous public.

Again, persons the most strictly moral and religious may be, and, we are sorry to have to add, daily are the vilest quacks on earth. Many of our ministers, not to mention others in inferior stations, practice in things—medicine for example—of which they are not only wholly ignorant, but lend their influence to others to do the same thing, who are equally ignorant—thus committing the two-fold (though we trust, unintentional) crime, of first quacking themselves, and then helping to manufacture others—from simply, though very benevolently, assuming that morals and religion *alone*, are sufficient without intellect, or proper information on the subject. This is a mistake, we believe, most alarmingly extensive, and strongly demanding a speedy corrective.

The moral and physical laws, though they may and do act in harmony, are nevertheless independent the one of the other. A physical law declares a vessel will sink, if she spring a leak, or her bottom start, and all on board perish, let their morality and religion be ever so pure.

So, a patient may and will as certainly perish, if he take a dose of poison, ignorantly administered, though it be by the best of divines—for nature asserts that a physical law has been most grossly violated—and notwithstanding the moral and divine law may be thoroughly kept, yet the two sets of laws are so far disconnected and independent, the one of the other, as not to be able to avert the penalty of one by keeping the other, but that each will have its separate reward and punishment for each separate violation and obedience. With these remarks on quackery in general, we propose to offer a few suggestions, in continuation of



those we made in the last number of our paper, on that species of imposture denominated Dental Quackery—and

First: We would suggest that every state in the Union should follow the noble example set by Maryland in declaring, through her legislature, that it is high time this much neglected branch of science should be more attended to and cultivated—that its principles should be more extended and understood—and finally, that the public should be more protected than it has hitherto been, by the lights of dental science, from the daily presumption and ignorance of such hosts of practising pretenders.

Hence the legislature of Maryland, in addition to expressing her sense of the suffering and cruelty which the people were enduring from allowing such an immense number of ignorant pretenders to stalk abroad, and freely and fearfully to practice upon the health and lives of the community, without scarcely a ray of light from the sun of dental science to guide through, and help to stay and dispense this midnight gloom.

We say, in such condition of mental darkness and practice, the legislature of Maryland saw fit to incorporate the Baltimore College of Dental Surgery, as one means of dispensing light and knowledge on this subject, and thus furnish suitable persons who will go from this highly important institution, thoroughly qualified to practice properly the art of dentistry, expose the impositions of quacks, and thus successfully shield an important interest of society.

The great and prime object of this College is to elevate the standard and give dignity to the dental profession—by giving its pupils a sound and thorough education, both in the principles and practice of dentistry.

As it may not be generally known, it may be well to mention its general scope of instruction. There are four professorships, viz.

1. Dental Physiology and Pathology.
2. Practical Dentistry.
3. Special Pathology and Therapeutics.
4. Anatomy and Physiology.

And here we would wish to call special attention to the fact of there being a chair expressly provided for teaching the practical

parts—embracing all the manipulations pertaining both to the surgical and mechanical departments of the profession.

In a word, preparing the student in a more thorough manner, and in a much shorter time than can possibly be done in any dentist's office for the immediate and active duties of his profession—while at the same time he has the advantage of being carefully taught the principles of the science—not simply the healthy and morbid conditions of the teeth—but further, the various relations of the teeth in these two states to the whole and every part of the body.

Hence, disease, general and special—and anatomy, general and special, from being related with, and especially influenced by, the condition of the dental apparatus, are considered as essential parts of instruction to a properly qualified dentist.

A second suggestion is, that persons about to enter the dental profession, should secure proper preparatory educations before entering it.

This would be a most important step to banish quackery, for when the mind becomes enlightened even in general knowledge, it will most usually, unless those roughly corrupted, shrink from practising any particular portion of knowledge—without suitable qualifications.

And the last suggestion we at this time have to offer, is the necessity of union among the dentists throughout the whole United States—union of feeling and interest—a reciprocal and willing interchange of opinion and practice, and frequent meetings and associations, for the diffusion of dental light and truth among the profession in particular, and the people at large—as another and powerful means of staying the torrent of dental quackery which is still sweeping over our land.—*Dental Intelligencer*.

## Collectanea.

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*The Burning Wells of Kenawha.*—The following account of a most curious phenomenon, although not strictly professional, will be read, we are quite sure, with interest. We are indebted for it to Mr. James Putney, of Virginia, lately a pupil in the Medical Institute of Louisville. Y.

The Kenawha salt-works of Virginia are confined to the banks of the river of that name, and extend eight or ten miles up and down the stream. These works have been, and are yet, the source of most of the domestic salt consumed in the west, and have been in active operation for more than thirty years. The salt-water by which this supply is afforded, is obtained by sinking a well on the brink of the river, at the point of low-water-mark, perforating the solid rocks by a hole not more than two or three inches in diameter; and it is a singular fact, that the salt-water is not to be obtained at any other point—not half a mile from the brink of the river. By a very tedious process, the rock has been penetrated to the depth of from six to twelve hundred feet, and in a few instances to even a greater depth. This operation was formerly accomplished by hand, or by horse-power, but is now done by means of steam. In boring to this immense depth, nothing is met with but the solid sand-stone rock, with the exception of two or three strata of bituminous coal. These strata are from a few inches to six feet in thickness, and are found only in the first five hundred feet. Fissures are sometimes met with in the rock which are a few inches in depth, and which contain water, or gas, sometimes both. As soon as the auger reaches these cavities the gas issues with great force, and is quickly exhausted. When a good fountain of salt-water is attained by the auger, it rises nearly to the level of the river, and is then pumped out, and forced into the reservoir for use.

To all who are acquainted with the history of these works it is known, that there exists in this county a remarkable phenomenon, which has received the common appellation of the *Burning Springs*. These are nothing more than excavations in the earth, capable of containing sixty or eighty gallons, and which, in a wet season, are filled with water. The gas rising through the water gives it the appearance of a great boiling caldron, which, if a torch be applied, instantly takes fire, and burns with a beautiful lambent flame. This has excited great fear and astonishment among the ignorant and superstitious, from the circumstance of the water's boiling, and apparently burning on its surface, and yet remaining cold. But a more recent

exhibition of this phenomenon is to be seen in the *Gas-wells*, a short description of which I will now proceed to give.

A gentleman in boring his well, after having penetrated about one thousand feet, was surprised at an immense rush of gas, the carburetted hydrogen, mixed with strong salt-water. The gas was expelled with such force that it threw the water at least a hundred feet into the air, forming a most beautiful *jet d'eau*, and covering the earth with its white briny foam. The gas and water thus continued to be thrown out for many weeks, when the owner of the well began to think of turning it to some useful purpose. He proceeded to adjust suitable pipes to the well, and conveyed the gas to the reservoir on the top of the bank, the gas forcing the water before it with great power. By an apparatus fixed for the purpose, the water was separated from the gas, and both were conveyed to the furnace—the water into the pans, and the gas to the fire, to be applied to the bottoms of the pans. The whole furnace was thus filled with flame by which it was found that a saving of two-thirds of the fuel was effected. It was estimated that the quantity of gas emitted in twenty-four hours was sufficient to evaporate sixteen hundred gallons of water. The pipes in which it was conveyed to the furnace were five inches in diameter, and yet such was the force with which it was expelled, that a man was not capable of holding his hand upon the mouth of one of the pipes. A constant stream continues to issue from the well, its velocity, every few seconds, being much accelerated, in which it very much resembles the escape of steam from the engine of one of our largest steamboats, not, however, with the same regularity, nor with such distinct intermissions. The process of manufacturing salt with this gas is exceedingly interesting. The gas first expels the salt-water from the bottom of the well, and forces it into the reservoir. Then being ignited beneath the furnace, it converts the salt-water into brine. The brine is next conveyed into a wooden vat, and is then converted into salt, by the agency of the same steam which was generated in converting the water into brine.

The eruption of the gas at this point occurred about two years since, and it has continued to be emitted with the same copiousness ever since. A few months after its first expulsion, another well was bored at a distance from it of about a hundred yards with similar results, the quantity of gas discharged being fully equal to that of the first. Since that time six other wells have afforded the same phenomenon, and one of these in particular deserves notice on account of the vast quantity of the gas and water thrown out. This is about a mile distant from the first. This well, it is computed, will supply salt-water in sufficient quantities to make a thousand bushels of salt in twenty-four hours, and enough gas to convert forty or fifty thousand gallons of water into steam. In some of these wells the salt-water is, unfortunately, not very strong, and it is found a difficult matter to bore them to a greater depth.

An occurrence lately took place in one of these wells worthy of notice. After having emitted the gas for some time, the escape suddenly ceased,

and in the belief that some obstruction was offered to its egress, the workmen were ordered to sink the augers and remove the obstacle. Suddenly a trembling of the earth was observed for many yards around the well, followed by a violent explosion, and a forcible expulsion of the augers, and a flame of fire—which presented a beautiful, and even sublime spectacle. The gas continued to burn until it was extinguished by the violence of the winds. Ever since, there has been a free emission of the gas. How long it will last, of course, cannot be determined; there seems to be no diminution in quantity since its first appearance.

The *burning* springs above referred to, have been bubbling up ever since the first white man set his foot upon this strange soil, without any diminution of energy. The amount expelled from them is no trifle—probably enough to furnish this city with lights. The gas which issues from them, as well as from the eight wells, is impure, though it burns with a beautiful flame. Before, as well as after, it is ignited, it exhales a most disagreeable sulphurous odor.

J. P.

*Louisville, February, 1844.*

*West. Jour. Med. and Surg.*

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*Cyst in the orbital cavity.* By Dr. DORNBLUTH.—A girl, 22 years of age, was seized with a rheumatic affection of the eye, for which antiphlogistic remedies were employed. These relieved the symptoms, but in a few weeks the eyelids swelled, the eye became red and painful, and resisted all modes of cure. About four months afterwards she consulted Dr. Dornbluth. The pain in the eye was then so acute as to prevent sleep, and her body had wasted considerably. The eye was pushed out of its situation towards the temporal region, so as to be beyond the orbit. The eyelid, though stretched to its utmost extent, could not cover more than the half of the cornea; which, however, still retained its transparency. The iris was dilated and immovable, but the anterior chamber of the eye appeared natural. The most attentive examination could not detect the slightest alteration in the deep humors of the eye. Vision had been failing for about four months, but now the brightest sun's rays produced no effect on the eye; there was total blindness. The sclerotic conjunctiva was very red, swollen and resistant, and formed a considerable projection. Behind and on the nasal side of the eyeball, projected a fleshy mass, of about the size of an egg, and extending from the middle of the nasal to the superior maxillary bone. This fleshy mass was exquisitely tender, was covered with a smooth membrane, and discharged, copiously, mucous fluid and tears. The girl's health was seriously affected; she was feverish, had thirst, and loss of appetite.

As the nature of the tumor was not at first recognized, and topical applications gave no relief, a puncture was made in it, from which a considerable quantity of transparent serous-looking fluid escaped, and continued more or

less for two days, by which time a notable diminution of its size was observed. The aperture was then enlarged, and it was recognized that the tumor consisted of a cyst about two lines in thickness, and two and one-half inches in depth, which filled the whole of the orbital cavity, and pushed the eyeball forwards. The cavity of the cyst was filled with lint, an abundant suppuration ensued, and the fifth day thereafter the membrane of the cyst was thrown off. The tumor diminished rapidly in size after this, and the wound healed over in eight days. The eyeball regained its normal position, and was again covered by the eyelid, which moved freely over it, but the eye never recovered its sensibility to light.—*Edin. Med. & Surg. Jour—Am. Jour. Med. Sci.*

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*Filing the Teeth.*—Mr. Robinson, in an article on filing the teeth, published in the *Forceps*, says, the teeth that are more generally attacked with caries, and for which the application of the file is more frequently brought into request, are the four central incisors and canines of the upper jaw, although in many instances it may be used with success to the bicuspid and molars of both jaws. The permanent central and lateral incisors of the upper jaw frequently decay at an early period at their sides. This arises either from a too crowded state of the mouth, and the undue influence exercised on the parts by their too rapid advance before the maxillary arch is sufficiently developed to admit the increased size, or from the patient at that period neglecting to perform those daily ablutions so essential and necessary to the health of these organs. In either case it unquestionably forms the exciting cause of caries in those situations, which, if allowed to extend beyond a certain point, renders the operation both difficult and dangerous to the tooth itself, owing to the confined space the operator has to use his instruments, with that force so requisite to the well packing of the gold to the exclusion of all foreign substances, with the liability of fracturing the enamel. Even if this difficulty should be overcome, the tooth may be broken in the attempt at stopping it, or the gold may become loose at the end of a few months. Hence arises the necessity of filing in the early stages of caries, in preference to stopping. In every stage which requires the use of the file, the dentist ought not to be content with merely dividing the teeth, but should extend the operation until the whole disease in the tooth is eradicated, and presents a surface as white as the healthy part of the tooth. A considerable portion of a tooth can be filed away without the slightest injury, if the operation be performed with caution, and the posterior portion removed without any perceptible disfigurement; in many cases, the caries can be removed by scraping away with an instrument, without having recourse to the file. Mr. Robinson has frequently, after dividing a tooth, discovered near its cutting edge a large cavity, which it would be impossible to remove without destroying more than half the tooth, and disfiguring the patient; in

any attempt to stop it with gold, the chances would be, either a fracture or an imperfect stopping. In these cases, he has substituted gum-mastic steeped in water—an admirable substitute—which has remained in the cavity for months, and can be renewed at pleasure by the patient. In many instances, when the cavities have been examined three or four years afterwards, they have been found perfectly healthy, not in the least indicating a return of the disease.—*London Medical Times*.—*Boston Med. & Surg. Jour.*

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*Rupture of the Trachea.*—Dr. BREDSCHIEDER reports in *Casper's Wochenschrift*, the case of an infant fifteen months old, affected with bronchitis, who after a spell of coughing, had an emphysematous tumor in front of the neck. A small incision was made in this tumor, which gave issue to air, which escaped with a hissing noise. The child died two hours after the accident, and on examination a rupture half an inch long was found in the trachea, below its first ring.—*Journ. de Connaiss. Méd. Chirurg.*—*Am. Jour. Med. Sci.*

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## Miscellaneous Notices.

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*Baltimore College of Dental Surgery.*—The regular Course of Lectures in this Institution begin the first Monday in November next, and continue four months.

The readers of the Journal are aware of the existence and locality of the Dental College, and of its being established and receiving its charter from the Legislature of Maryland, about four years ago.

They are also aware, that the great leading object in establishing this school, was and is, the elevation of the standard of the dental profession; of making scientific dentists, by educating young men thoroughly in all the different branches of dental knowledge, and thus sending them forth into the community fully qualified to do credit to themselves, to their profession, and by their practical skill and success, to their patients.

But, notwithstanding all this is known, there still, however, seems to be an impression among many members of the dental profession, that the Baltimore Dental College imparts to the student much more of a theoretical, than of that real substantial practical knowledge which is to constitute the main business of his life. It is to correct this error that the following remarks are principally intended.

It is true, that the principles of dental science are fully discussed, and their great value and importance seriously enforced, through the whole course, upon the attention of the student, as the great and only true guide—

the only unerring compass, by which he can either rationally, successfully, or satisfactorily regulate, and honorably conduct his after practical life.

That the principles of dental science should be taught, we do not for a moment suppose any well informed dentist hesitates a single instant to admit, and further, that these principles are the acknowledged levers—the only trustworthy and great fundamental truths, on which is reared the great structure of the dental art, and only by and through which, this art can ever expect to be practiced with becoming respect, dignity, and success.

This may be acknowledged as true, but it is still urged that there is not sufficient attention given to the surgical and mechanical parts of dentistry; in other words, it is feared, the head is educated too much, and the hand too little.

To this we reply, and it gives us great pleasure to correct so false an impression, that there is a distinct and separate chair, for teaching Surgical and Mechanical Dentistry exclusively, and that this chair is filled by a professor, who devotes his whole time to this department, and not only demonstrates to the student the different manipulations, but further requires, that he shall do for himself all the practical duties, and not only once, but this is his business to drill his fingers from day to day, through the whole course of lectures.

To enable the professor to carry out this practical plan of teaching all the students at once, the College is furnished with abundant room, and in which one is set apart expressly as a surgical and mechanical workshop, containing all the instruments and appliances suited to the different manipulations of these two practical branches, and sufficiently commodious to accommodate a large class. Ample opportunity is given to each student to witness and perform every variety of operation upon the natural or living teeth.

Here it is that surgical and mechanical dentistry is taught, and our readers will thus see that ample provision has been made for teaching the *practical* part of the profession.

The other departments comprise:

Dental Physiology and Pathology,  
Special Pathology and Therapeutics, and  
Anatomy and Physiology.

In each of these, it is likewise the constant aim of the several professors to make them as practical as possible. For example, anatomy is thoroughly taught on the fresh subject, and each student is likewise expected to dissect for himself. For this purpose the college contains a dissecting room, not inferior to that of any medical school, and always abundantly supplied with subjects.

The College, we may add further, has a general lecture room and a museum, which, with one of the finest dental libraries in the world—though not in the College, but to which the students can have free access—furnishes some idea of the facilities and advantages which it gives to those who come to its halls for instruction in dental science.

And it is firmly believed, and we think may be confidently asserted, that



in even a single course spent in such an Institution, more real knowledge is gained, both in the principles and practice of dental surgery, than can be acquired in two years in any private office. H.

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*To Correspondents.*—The Baltimore Editor having been absent for several months, on a tour through the Southern and Western States, found, on his return, a large number of letters and communications from correspondents, some of which should have been replied to immediately. His absence from the city, he hopes, will be received as a sufficient apology for what might otherwise be regarded as neglect on his part. They shall receive immediate attention after his return from New York, which place he is compelled to visit at once, to attend the Fifth Annual Meeting of the American Society of Dental Surgeons.

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*To our Subscribers.*—The delay in the publication of the present number of the Journal was occasioned by the absence of the Baltimore Editor.

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*Gossip with our Profession, by the Junior Editor.*—We perceive, with regret, that some of the members of the American Society of Dental Surgeons, have mistaken the language of the Society's Diploma—supposing it conferred the degree of doctor of dental surgery. Such are informed that the Society has not the power, (being yet unchartered,) to confer any degree—its Diploma being a certificate of membership only. The Baltimore College of Dental Surgery is the only institution having authority to confer the degree of D. D. S. . . . If those of our profession who do not take the Boston Medical and Surgical Journal, could know how much of its excellent contents have a direct connexion with our own science, and how cordially the interests of our profession are advocated by its courteous editor, there would be few, we opine, who could hesitate an instant about paying three dollars a year for so valuable a periodical. . . . Filling teeth with any paste or cement has, in our neighborhood, gone out of practice, we believe; and we heartily congratulate the people thereupon. We have recently had occasion to operate for a gentleman, greatly distinguished for his inventions and productions in mechanics, who had his teeth filled with Mercurial Paste, in London, and, in consequence, lost his health, and nearly lost his life. It is our intention, (if permitted) to report the case for this Journal, and to accompany the report with the testimonials of some of the highest medical authorities in this region. . . . There is advertised in the "London Times," a cement, patronized by their Majesties, Highnesses, &c.—with which people may plug their own teeth! We expect the next reach in humbuggery will be some new operation of lithotomy, to be performed upon the patient by himself. M.

Washington City, July, 1844.

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A  
TREATISE  
ON THE  
ANATOMY AND PHYSIOLOGY  
OF  
THE TEETH,  
&c. &c.  
THEIR DISEASES AND TREATMENT.  
WITH  
PRACTICAL OBSERVATIONS  
ON  
ARTIFICIAL TEETH,  
RULES FOR THEIR CONSTRUCTION.

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BY DAVID WEMYSS JOBSON, M. R. C. S. E.

DENTIST IN ORDINARY TO HIS MAJESTY,  
AND TO HIS ROYAL HIGHNESS THE DUKE OF SUSSEX, ETC.

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1844.



TO  
THE RIGHT HONORABLE  
THE EARL OF CAMPERDOWN.

MY LORD,

I should not have ventured, from the recollection of lasting obligation, to have inscribed to your Lordship a work so limited in its nature and object as the following, were I not aware of the interest which your Lordship feels in the productions of all classes of your countrymen.

On this ground alone, I respectfully beg leave to avail myself of your Lordship's permission, to dedicate it to you.

I have the honor to be, My Lord,

Your Lordship's

Obliged and Obedient Servant,

DAVID WEMYSS JOBSON.

109, GEORGE STREET, EDINBURGH,  
*March, 1834.*



## P R E F A C E .

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IN submitting these pages to the public, the author is aware that he has been preceded in many of his observations, by those which occur in the writings of Hunter and of Fox. Numerous improvements, however, have been made, in every department of the dentist's profession, since the publication of these standard works, and they do not appear to have been adequately noticed by subsequent writers ; with the exception, indeed, of Mr. Bell, whose able work on the teeth is worthy of being placed by the side of either of those of his predecessors, both in point of the accuracy of his observations, and the scientific mode in which they are conveyed.

These writings might have rendered any other superfluous, were it not for their elaborate detail ; which, however acceptable it may be to the profession, has perhaps prevented their being studied, by medical practitioners at large, with the attention which they merit. This may account for the indifference, or rather the ignorance, which a great majority of general practitioners display, both of the nature of the teeth, and of their affections. Such neglect, at the present day, is the more surprising, when it is considered with what attention they were regarded, two-thirds of a century ago, by the celebrated surgeon, John Hunter, whose work on the teeth may be considered as the basis on which almost all our subsequent knowledge has been raised ; and, like all his other writings, is so strikingly characterized by that power and originality of genius, which reflected light on every subject on which it rested.

If the present elementary outline, founded chiefly on his views, shall have the merit of imparting to the medical student and general practitioner some knowledge of a branch of the profession which is daily becoming of wider importance, one of my chief objects will be fully accomplished.

But though generally following the views of Hunter and his successors, I have endeavored to avoid several inaccuracies into which they seem to have fallen. The opinion which Hunter held of the non-vascularity of the teeth, has been since demonstrated to be so erroneous, that any notice of it now, may be considered as out of date. In other respects, the remarks I have made on the structure of the teeth, and the mode of treating their affections, will be found to be nearly in unison with theirs; as experience has proved the former to be just, and the latter to be at least equal, in point of efficiency, to any that has been subsequently recommended.

My observations upon Artificial Teeth, I think, will be found to be more explicit than those of any preceding author; and it has been my aim to render what I have said, not only upon this subject, but on every other which usually falls under the notice of the dentist, as far as possible, of a practical nature. At least, I can confidently assert, that the directions which I have proposed for the construction of these, have been given without any of those illiberal attempts at mystification, with which almost all writers on this subject have hitherto studiously enveloped their description.

As the principal merit of an outline of any science consists in its being coeval with the discoveries of the day, it will be necessary to notice in these pages several innovations which have been made since the time of Hunter and Fox. The chief of these is the new mode of stuffing the teeth by means of "anodyne cements,"\* and "mineral pastes," recently so much in vogue. Of

\* The term "anodyne cement," was originally applied to a substance discovered by a gentleman of the name of Clark—formerly a teacher in Inverness Academy,† but now a dentist of eminence in London. He has not divulged its composition; but it is supposed to be extremely simple in its nature, and even by many asserted to be merely a mixture of lime and egg.

The success attending the novelty of his practice immediately set all the empirics of the age in commotion. Accordingly a host of imitators started

† I trust Mr. Clark will not consider this remark invidious. It is really necessary, to distinguish him from other practitioners of the same name.

these poisonous amalgams of mercury with lead, and other equally deleterious metallic oxides, I own I know but little, and have no desire whatever to have the knowledge increased. Such compounds have never been countenanced by any enlightened member of the profession, and are now rapidly falling into merited disgrace.

D. W. J.

109, GEORGE STREET, EDINBURGH,  
*February, 1834.*

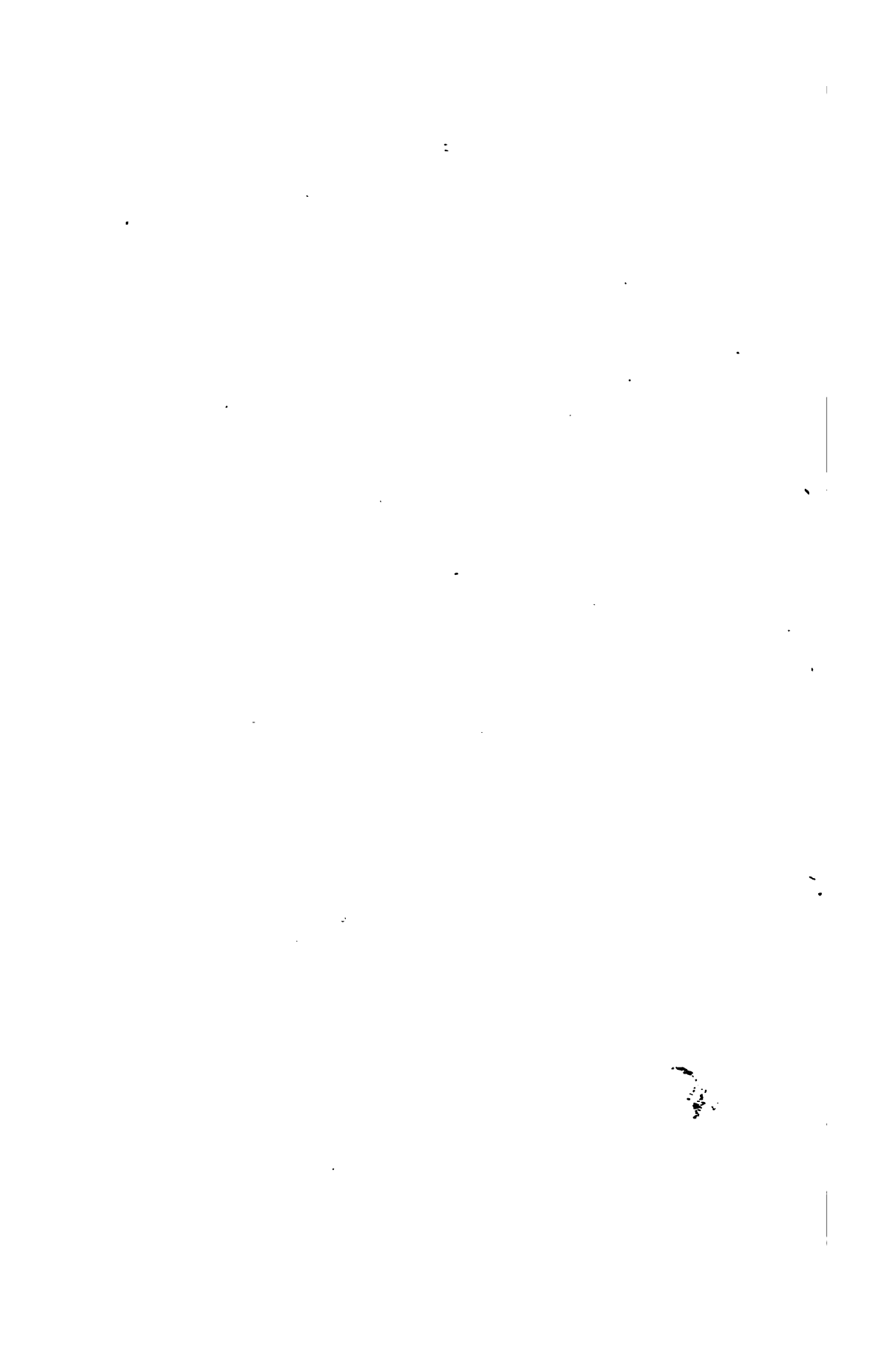
up; every one of whom, successively, has without hesitation claimed the discovery as his own, and appropriated the name of "anodyne cement," to his irritating and poisonous compound. Nay, some of them are said to have carried the deception so far as to assume the inventor's name.

Mr. C. has thus, in defence of his "Cement," had to contend with rivals, infinitely more numerous than the cities (*magna componere parvis*) which contested with Athens for the honor of giving birth to Homer, or the Italian towns for the burial of Tasso.

These are the "Marvellous Anodyne Cements," and "Infallible Mineral Succedanea," with glowing puffs of which every daily, hebdomadal, and monthly journal teems; and the unblushing reports which their veracious authors advertise of their efficacy, would be wonderful indeed, if—in newspaper verbiage—they were true.

It is but justice to Mr. Clark to state, that his mode of applying the "cement," is materially different from that of the persons alluded to. The "cement," I am informed, is, by him, chiefly used as a temporary stuffing for alleviating the pain, before permanently stopping the tooth with gold; which, I believe, he afterwards does in the usual way. This mode of practice is, of course, highly lucrative, as it requires numerous applications, and frequent attendance. The practice of his rivals is much more expeditious. They at once plug up the cavity with their nostrum; leaving the caries—the source of the disease—unremoved. The decay thus goes on, in the interior of the tooth, more rapidly than ever. They, moreover, invariably "finish" on the first visit; being well aware that their patients will rarely indulge them with a second.





## PART I.

### THE ANATOMY AND PHYSIOLOGY OF THE TEETH, &c.

#### CHAPTER I.

##### ON DENTITION.

*Of the First Dentition—Its frequent danger—Severe Constitutional Sympathy attending it—Prevention of this, and Mode of Treatment—Remarks on the Second Dentition—Pain arising during the advance of the Wisdom Teeth—Means of Alleviation.*

THERE is perhaps no period of life so critical to the child, and interesting to the parent, as that of the first dentition. The delicate organization of the body—at all times highly susceptible—seems to be peculiarly sensitive at the period when nature ordains that the infant shall no longer be nourished by the breast of its mother; when the tongue and lips shall no more be used only for suction, but its mouth provided with the instruments requisite for the coarser food, on which the child is destined henceforth to subsist.

The advance of the teeth is generally attended with some considerable sympathetic affection of the constitution, which is usually in a greater or less degree, according to the strength or the debility of the infant. In robust and healthy children the irritation is in general slight, although even in these there is occasionally considerable constitutional derangement.

For some time before the teeth appear, the child becomes fretful, and exhibits considerable tenderness of the gums, with a tendency to carry its hands, or any thing within reach, to the mouth. There is at the same time, an increased discharge of the saliva, occasionally accompanied with a gentle fever, trifling eruption of the skin, and slight diarrhœa.

These symptoms are not to be considered as dangerous, or even unfavorable; as the increased excretions act beneficially by

diminishing any inflammatory tendency, and they generally subside whenever the teeth perforate the gums.

But when the child is feeble, and the teeth meet with any serious obstacle in their progress, the constitutional derangement becomes much more severe. The sufferings of the infant are extremely acute; its restlessness great, accompanied with distressing cries, and continual moaning. The irritation of the mouth is so great, that the slightest touch occasions violent pain. The inflammation is soon extended to the face and head, and ultimately to the thoracic and abdominal viscera; giving rise to suffusion of the countenance and of the eyes, oppression of the head, difficulty of respiration, accompanied with a harassing cough, quick and fluttering pulse, great heat and dryness of the skin, and finally, high sympathetic fever. The digestive organs are also much deranged, the diarrhoea becomes severe, and the discharges acrid. Violent muscular spasms and convulsions, hourly increasing in frequency and violence, at length supervene, and rapidly prove fatal, unless active measures of relief are immediately resorted to.

Such are the severe constitutional symptoms which occasionally arise from a source apparently so trifling as the obstacle which a tooth encounters in passing from its socket to the surface, and which but too often terminate only at the moment when the little sufferer ceases to exist.\*

#### TREATMENT.

The whole of these distressing symptoms may be in a great measure prevented by the timely scarification of the gums.

Whenever the restlessness of the child—its frequent application of the fingers to the mouth, and a profuse flow of saliva—indicate that something unusual is going on, a careful examination of the mouth should be made, and if any of that inflammatory distension of the gums, which is occasioned by the pressure of a tooth, be observed, a semi-lunar incision, or, what is preferable, two crucial ones, should immediately be made over the inflamed part with a gum lancet.

\* The occurrence of confirmed hydrocephalus is amongst the most common results of such affections. It appears, indeed, that the irritation of dentition has not been sufficiently attended to as the origin of this disease. Were this view of the case more generally taken, it is, I think, probable that it may in many cases be arrested in its earlier stages, and its dreadful consequences—death, or a state of idiocy, far worse than death—be frequently prevented.

“We frequently find not only constitutions of the most healthy character thus become the subjects of the most acute forms of disease, but also that the latent seeds of scrofula, and other malignant constitutional disorders, are frequently brought into action by this cause.”—T. BELL.

The relief thus afforded is immediate; and it is surprising, indeed, that prejudice should ever be prevalent against a mode of treatment so beneficial to the infant sufferer. Nevertheless this absurd prejudice often exists to a great extent on the part of the mother or the nurse, from the supposition that the operation is productive of much pain to the child. Now the pain arising from scarification is inconsiderable, and but momentary, and the child would probably cry as much were its gums pressed lightly with the finger instead of the lancet; while the relief which the operation affords is great and permanent.

But when, from the neglect of this trivial operation, those dangerous symptoms, already enumerated as attendant on dentition, have appeared, the most active constitutional, as well as local remedies, must immediately be resorted to, to save the life of the infant.

The child should, as quickly as possible, be placed in a warm bath, for the purpose of causing a determination of the blood to the surface, and thus relieving the difficulty of respiration occasioned by the oppression of the lungs. Blisters should, with the same view, be applied to the breast, to the nape of the neck, or behind the ears, to withdraw, if possible, the irritation from the brain. The bowels must also be attended to; and, to prevent inflammation of them, cathartic and sudorific medicines administered, (calomel, scammony, and antimonial powder.) But if there is any tendency to violent diarrhœa, these must be discontinued, and anti-purgatives and anti-diaphoretics substituted for them. (Of these magnesia, and the pulv. cretæ cum opio, are perhaps the best for the purpose.)

But, above all things, it is necessary to remove the source of the irritation. The mouth should be minutely examined, and if any distension of the gum be discovered, scarification should instantly be performed.\*

In fact, I believe that the difficulty and the danger of dentition may always be alleviated, if not wholly averted, by the early use of the gum lancet. The medical attendant of the child should be aware of the period at which the teeth usually appear, and of the order in which they generally perforate the gum. Possessed of

\* "The prejudices of former times," Mr. Bell observes, in his able work already quoted, "against this simple, but most efficacious operation, are fast yielding to the frequent evidence of its harmlessness and utility. It is impossible for the most prejudiced to witness the effects which continually result from it, without becoming a convert to its use. In the midst of the most imminent danger, when death has almost been anticipated, as the only relief from severe and hopeless suffering, this simple and trifling operation has, in innumerable instances, restored the young sufferers to their parents, in a state of ease and safety which, in so short a space of time, would scarcely have appeared credible."

this knowledge, he should examine the child's mouth several weeks before the teeth are expected to advance; and, if the slightest indication of undue pressure on the gum is observed, scarification should be effectually performed.

It should be kept in view, that the operation, at this period, is performed, not for the purpose of affording an immediate outlet to the tooth, which is then at a considerable distance from the surface; and, even if it were exposed by the incision, the gum will generally re-unite over it, apparently as firmly as before it was cut; but will afterwards more easily yield to the pressure of the tooth, when ready to advance; in conformity with that well-known law of nature, which ordains, that any part of the body, that has once been wounded, shall ever afterwards possess a smaller degree of vitality, and consequently give way more readily, than the untouched part of the structure.

#### ON THE SECOND DENTITION.

The second dentition is rarely attended with any of the painful concomitant symptoms of the first. Indeed, the whole of the second set, with the exception of the wisdom teeth, usually perforate the gums without the knowledge of the individual. With the *dentes sapientiæ*, however—which rarely appear until the nineteenth or twentieth year, when almost the whole space, in the maxillary bones, allotted to the teeth, is fully occupied—all the pain of the first dentition is frequently revived.

The irritation produced on the surrounding parts, from want of sufficient room for the advancing teeth, generally gives rise to severe and continued suffering, which is often accompanied with much inflammation of the mouth, and considerable swelling of the face. I can, unluckily, speak of this from experience, having suffered severely while obtaining my own, and witnessed many similar instances; nay, I believe a case is on record, which terminated fatally, from the dreadful inflammation caused by an advancing wisdom tooth burrowing under the large grinder in front of it.

Much relief will generally be derived from scarification of the gum, or by the excision of a small part of it over the expected tooth; though it may sometimes be necessary to extract the second molaris, in order to afford the requisite space.

## CHAPTER II.

## ON THE STRUCTURE OF THE TEETH.

*Of the General Organization of the Teeth—Comparative View of the Teeth in Man, and in the Inferior Animals—General Description of the Teeth; their Formation, Structure, and Chemical Composition—their Osseous Substance—their Enamel.*

THE teeth may be defined to be the organs provided for the mastication of substances requisite for the support of life. For this purpose they are admirably adapted, being throughout by far the most solid structure in the body, and externally protected by an enamel, which is one of the hardest substances in nature. They also serve several minor objects, and materially contribute to the beauty of the face, and the perfection of the speech.

There is no other structure in the body to which the teeth bear a near resemblance. They have, it is true, by some writers, been compared to the bones; but they are possessed of a much smaller share of vitality, and have not the power of regenerating themselves, as these do, when injured by disease. By others, again, especially the French authors, they are considered as analogous to the nails and the hair. The analogy, if there be any, is extremely slight, as the teeth are possessed of a far higher order of organization.

On the whole, however, they resemble the bones more than any other part of the body, both in their chemical composition and general structure; being, like these, formed by the union of gelatinous matter with an earthy base; and supplied with blood vessels, nerves and absorbents, from the two first of which they derive their vitality and powers of sensation, and, by means of the last, have their substance removed when it is no longer requisite; as in the case of the absorption of the roots of the first set of teeth, to make way for the bodies of those of the second. Farther than this the resemblance does not extend: the enamel of the teeth is totally different from any other animal substance, and might alone entitle them to be considered as a homogeneous structure.

On this subject, however, I shall not enter into detail, being convinced that it would lead to no practical utility, and would prove infinitely more uninteresting than even the discussion which has been started on the question of the original and natural food of man, as deduced from the structure of his teeth, compared with those of the lower animals; and which, as I shall not swell my

pages by enlarging on it elsewhere, it may be well briefly to notice here.

In the inferior animals, the teeth are found to vary in their form and structure, according to the habits of the animal, and the mode in which it lives. If it is a beast of prey—subsisting on the bodies of others, and using its teeth as instruments of attack and defence—one class of them (the canines) will be found to be extremely large, prominent, and pointed; another (the molares) are also large, irregular on their surfaces, and having numerous prominences or points on their crowns; while the third class (the incisors) are small, and rather imperfectly developed: and the bodies of all the teeth are surrounded by a thick covering of enamel.

But if the animal lives on vegetable productions, and is inoffensive in its nature, the incisor and grinding classes of teeth predominate, and are the most fully formed. Their crowns and edges are also smoother, and less irregular; and the enamel, instead of surrounding the bodies of the teeth, is intermixed in layers with their osseous substance.

In the species of *Rodentia*, again, or gnawing animals, of which the beaver is the most perfect type, the incisors are much more fully developed than any of the other classes; and the enamel by which their bodies are protected is not only extremely hard, but their interior substance also appears to be more dense than in the teeth of other animals. The same structure may be observed in the teeth of the rat, and in all the animals of this class; most of which use these organs, not only for the mastication of their food, but also in the construction of their domiciles, or as instruments for extending their ravages.

These differences in development of the several classes of the teeth will be most strikingly observed, on comparing together those of the animals which are usually considered as the most perfect representatives of the species to which they respectively belong; as, for instance, the horse or the ox in the herbivorous order, and the lion, the emblem of the carnivorous.

The naturalist is thus often enabled, by the appearance of the teeth—which, from their greater solidity, usually remain perfect long after every other part of the body has been consumed—to discover the species to which the animal belongs; and (as in the case of those of antediluvian creation) to form some conception of their nature and habits, although no other traces of their existence remain.

The appearance of the human teeth presents a combination of the leading features of those of the different orders of inferior mammalia, man naturally subsisting both on animal and vegetable productions. The different classes of his teeth are nearly equally

developed, although the one corresponding to that so strikingly marked in carnivorous animals, is the most conspicuous. But they do not exhibit that superiority of formation in one order over that of another, which is so general in the rest of the mammalia; in which that particular class of teeth which is best adapted to the habits of the animal, is always more strikingly developed than any of the others.

## GENERAL DESCRIPTION OF THE TEETH.

In describing the appearance of a tooth, it is customary to speak of its *body*, or that part of it which is surrounded by the enamel, and usually projects beyond the gum; and of the *root* or *fang*, by means of which it is attached to its socket. The part where these two unite is termed the *neck* of the tooth; and the most superficial point of its body is named the *edge*, or the *crown*.

The whole of the roots, and all the interior part of the bodies of the teeth, consist of osseous substance; the bone of the latter being, as already observed, surrounded by the enamel. Of this protection the fangs are destitute, as they are wholly osseous. They are, however, more highly organized than any other part of the tooth, as the dental blood vessels and nerves not only pass through them, but they are also surrounded and attached to their sockets by a highly vascular and nutrient membrane, analogous to the *periosteum* of the bones. From this additional source of nutrition, they are possessed of a considerably greater degree of vitality, and are thus often found to be sound and healthy, when the whole of the bodies of the teeth have been destroyed by caries.

In the interior of the fang and body of each tooth, there exists a *canal*, through which the dental blood vessels and nerves extend. These enter by an orifice at the extremity of each root. This part of the canal is, in young teeth, generally the widest; but when the tooth is completely formed, the opening here is usually exceedingly small, and, indeed, often imperceptible. The canal gradually becomes wider in its course, until it reaches the centre of the body of the tooth, where its diameter is greatest, and a little below which it terminates.

The canal is seen to greatest perfection in the adult tooth. After the twenty-first year of age, it gradually decreases in size, and beyond the forty-fifth or fiftieth years, there are rarely any traces of it remaining, excepting a discolored spot in the solid tooth, if it be transversely divided.

The *parietes* of the canal are lined by a highly delicate membrane, similar to the internal periosteum, and forming a sheathe for the blood vessels and nerves on which they ramify before entering the osseous structure of the teeth.

This membrane does not adhere to the interior of the roots



with nearly so much tenacity as that which covers their exterior, but it contributes more highly to the vitality of the teeth. It is possessed of exquisite sensibility, and it is from inflammation of it that the acute pain of tooth-ache arises.

#### FORMATION OF THE TEETH.

The formation of the teeth commences at a considerable period before the birth of the child; the rudiments of them being found in the embryo at the end of the third month. When first observed, they are pulpy-looking, gelatinous substances, of a pellucid and semi-transparent appearance, extremely soft, and bearing little or no resemblance to the dense and hard bodies they afterwards become.

These delicate rudiments are placed in a groove, or furrow, which, at this early period, extends along the most superficial ridge of each maxillary bone, and constitutes the future alveolar processes, or sockets of the teeth. The pulps are at this period closely surrounded by an exceedingly delicate and vascular membrane, which is, apparently, also generative of them. Numerous small blood vessels ramify on this membrane, and, extending from it, permeate the pulpy body, and afford it nutrition.

Both the pulp and its investing tunic are enclosed in a stronger capsular membrane, which firmly adheres to the gum by one extremity, but at its other, remains unattached in the groove. This capsule derives its origin from the gum, and only loosely envelops the rudimentary pulp; being considerably larger than it, to admit of its growth.

Shortly after the formation of these pulpy substances, ossification commences on them at one or more points, and gradually extends, until the whole of the pulp is converted into bone. The osseous matter now deposited forms the bodies of the future teeth, the roots of which are still unformed, there being neither space nor occasion for them, until the bodies begin to make their way through the gums.

#### DEVELOPMENT OF THE ENAMEL.

When the ossification of the pulp is completed, all traces of its interior membrane appear to be lost. About the same time a peculiar action seems to take place in the vessels of the inner layer of the capsule; and a greenish coloured, chalk-looking powder, is deposited in successive layers, which rapidly unite into a very hard crystalline substance, the enamel of the teeth.

Although the formation of the enamel is so much later in commencing than that of the osseous part of the teeth, it is yet sooner completed; the enamel being wholly formed at the time that the teeth begin to appear beyond the gum, though little more than two-thirds of their roots are then developed.

These remarks are equally applicable to the first and second sets of teeth; the rudiments of both of which exist in the maxillary bones at the same period; those of the temporary set appearing first, and forming the source from which the permanent teeth are produced.

## COMPOSITION OF THE TEETH.

The teeth, as already mentioned, consist of two distinct substances,—bone and enamel. I shall now a little more minutely describe their respective peculiarities and chemical composition.

## OF THE OSSEOUS SUBSTANCE.

The osseous substance of the teeth resembles that of the bones, in its general properties and chemical nature; consisting, like it, of earthy matter in union with gelatin. But the teeth contain a much larger proportion of the earth than the bones do; and to this circumstance they owe their greater hardness and durability, which often remain unimpaired, when every trace of the rest of the osseous structure has disappeared.

This osseous matter forms the whole of the roots, and the greater part of the bodies, of the teeth. It is the only part of them that is organized; and that portion of it which forms the roots, appears to be more highly so than the other; as these often remain unaffected, when the bodies of the teeth have been completely destroyed by caries.

As analyzed by the celebrated Swedish chemist, Berzelius, 100 parts of the osseous substance of the teeth consist of—

|                            |       |
|----------------------------|-------|
| Phosphate of lime,         | 62    |
| Carbonate of lime,         | 5.5   |
| Fluate of lime,            | 2     |
| Phosphate of magnesia,     | 1     |
| Soda, and muriate of soda, | 1.5   |
| Gelatin,                   | 28    |
|                            | <hr/> |
|                            | 100   |

The whole of the calcareous part of the teeth is readily dissolved by any of the stronger acids, but the gelatinous portion is not affected by them; and it exists in so large a quantity, that, when the earthy bases are withdrawn, by placing a tooth in a solution of nitric acid, the figure of the tooth will still be retained, although it is left in a soft and flexible condition.

On the other hand, the gelatin is easily destroyed by exposure to heat; and if a tooth is passed through fire, the calcareous portion only will be left; but the form of the tooth (which has now been rendered hard and brittle) will, as in the former instance, be preserved.

## OF THE ENAMEL.

The enamel is the peculiar structure of the teeth, and it is chiefly on the perfection of its formation that their durability and beauty depend.

The manner in which it is formed is extremely mysterious, and is yet far from being thoroughly understood. It has been already mentioned, that, when the osseous part of the bodies of the teeth is completed, a peculiar change takes place in the outer capsular membrane: the inner layer of this either becomes detached from the outer, or a new membrane is given off from it, by which the body of the tooth is closely embraced, instead of being loosely surrounded by the capsule as hitherto. This membrane, whether a new or an old structure, is exceedingly vascular; and its vessels deposit a chalky looking substance, which ultimately is consolidated into the enamel; although it is totally unknown by what mysterious arrangement it happens that those arteries, which formerly deposited an osseous structure, should now create a matter so different, as this vitreous and crystalline substance is.

The enamel is deposited first, and in the largest quantities, on those parts of the teeth which are to be most frequently used, and where they are most liable to be worn down by friction. It will thus be found to be thickest on the edges, and on the anterior and posterior surfaces of the single teeth, and on the crowns of the double ones. The fibres of its crystals are, apparently with the same view, deposited in a peculiar manner, as they diverge from the body of the tooth, like radii from the centre of a circle. From this arrangement, they are not so apt to be splintered by hard substances, nor to be worn down by the constant friction, as they would if they had been deposited in a more perpendicular or horizontal direction.

The enamel is a crystalline vitreous looking body, and, when perfect, is one of the hardest substances in nature. It is transparent, and nearly colourless,—the different hues, which it occasionally exhibits, arising from the shade of the bone beneath. From its hardness, it is susceptible of a high polish from artificial means, and frequently acquires a still higher one in the mouth, from the continued friction of the tongue and lips.

The enamel does not possess much, if indeed any, vitality; neither blood vessels nor nerves entering its substance: but it is endued with the power of communicating external impressions to the nerves in the centre of the teeth. This is especially remarked when any agents, injurious to these, come in contact with it; and the communication gives rise to the familiar sensation, which is popularly expressed by the term of "the teeth set on edge."

Although the extreme hardness of the enamel, and its crystalline structure, greatly protect it from caries and external injury,

yet they render it exceedingly brittle when it is not supported by the osseous substance. A tooth will thus be frequently broken by a trifling accident, although no appearance of unsoundness had been previously observed. On examination, the enamel will be found to be nearly perfect, while almost the whole of the osseous interior has been excavated by caries.

As analyzed by Berzelius, 100 parts of the enamel contain—

|                                     |       |
|-------------------------------------|-------|
| Phosphate of lime,                  | 85.3  |
| Carbonate of lime,                  | 8     |
| Fluate of lime,                     | 3.2   |
| Phosphate of magnesia,              | 1.5   |
| Soda, and muriate of soda,          | 1     |
| Water and animal matter, (gelatin,) | 1     |
|                                     | <hr/> |
|                                     | 100   |

From this analysis it will be observed, that the enamel consists almost solely of earthy substances, and that the quantity of organic matter is incredibly small. There is no reason, however, to doubt the accuracy of the result which this distinguished chemist has given; although the proportions, which he mentions, are considerably different from those stated by Mr. Pepys, who made a similar experiment on the teeth, in the earlier part of this century, at the request of Mr. Fox, in whose work Pepys' analysis will be found detailed. But that of Berzelius is considered to be the more correct of the two; as he not only discovered the existence of fluato of lime and the salts of magnesia and soda both in the bone and enamel, which Mr. Pepys had failed to detect, but also ascertained the presence of the small proportion of gelatin in the latter, which the English chemist had singularly overlooked.

From the nature of the elements entering into its composition, it will be evident that all the acids will rapidly destroy the enamel. The injurious effects of these, not only when used in medicine, but in the far more reprehensible form of powders for "whitening" the teeth, will afterwards be noticed in another part of the work.

## CHAPTER III.

*Of the Maxillary Bones—their Alveolar Processes, or Sockets of the Teeth—Attachment of the Teeth to their Sockets—of the Membranes of the Teeth—of the Gums.*

I must refer to writers on osteology for a description of the maxillary bones, as it would be foreign to the purpose of a work like this to notice them farther than in their relation to the teeth.

It has been already mentioned, that in the embryo, at the end of the third, or in the course of the fourth month, a furrow may be observed extending along the surface of these bones, in which the rudiments of the teeth are placed. Shortly after the appearance of this groove, minute processes gradually project from the opposite sides of it, and, uniting in the centre, divide it into several cavities. These spaces are originally of considerable extent, and each of them generally contains two or three of the teeth; but by a process similar to that by which they were formed, they are increased in their number, and diminished in size, until at last they almost closely surround the teeth, whose sockets they eventually become.

It will not be necessary to give any description of the form and number of these sockets, as they exactly correspond to those of the roots of the teeth which they respectively contain. They are also dependent on the presence of the teeth, and invariably disappear when these have been removed either by disease, by violence, or by age. The latter occurrence, indeed—the falling out of the teeth in old age—solely arises from the destruction of the sockets by absorption.

It is generally supposed that the sockets which had first contained the temporary teeth are afterwards occupied by the permanent. This opinion is altogether erroneous, as each set of teeth has separate sockets of its own. The rudiments of the permanent teeth were, indeed, at first contained in the same cell with those of the temporary; but in proportion as the latter advanced towards the surface, and the growth of the former caused them to occupy a deeper situation in the jaw, distinct sockets were gradually formed for them, by absorption, in the interior of the bone. A communication, however, for some time exists between them by means of the cervix which connects the permanent with the temporary pulp. In proportion as the two sets separate, this cervix gradually lengthens, remaining attached by one

extremity to the rudiment of the permanent, and fixed at the other to the neck of the temporary teeth. This singular chain of communication between the two sets subsists even for some time after the temporary teeth have perforated the gums.

The teeth are attached to their sockets by that kind of articulation which by anatomists is termed *Gomphosis*, being analogous to the manner in which a nail is fixed when driven into a board. The sockets, however, are considerably larger than the roots of the teeth, and the space intervening is occupied by the dental periosteum.

This membrane is in every respect similar to the common periosteum of the other bones. It is highly vascular, and adheres with the greatest tenacity to the fangs of the teeth. From these it is reflected on the sockets, with whose periosteum it imperceptibly unites. The fibrous-looking bands by which it is so firmly attached to the teeth are supposed to consist almost wholly of blood vessels.

This membrane serves the double purposes of affording nutrition to the teeth and retaining them in their places, and their durability is chiefly dependent on its healthy condition. When it is attacked by inflammation, to which, from its great vascularity, it is especially subject, it is apt to separate from the teeth, unless the irritation is early subdued by local bleeding. If the detachment takes place, the teeth are deprived of their principal source of nutrition and support, and either quickly die, or become loose and fall out.

The other membrane is an exceedingly delicate one, existing within the canals in the centres of the teeth. It is highly vascular and exquisitely sensitive, and bears a close resemblance to the internal periosteum of the bones. It does not adhere to the osseous parietes of the canal with nearly so much tenacity as the external membrane does to the roots, but closely embraces the nerves and blood vessels, for which it forms a kind of sheath.

The canal in the centre of the teeth is occupied by this membrane, and the nerves and blood vessels which it encloses. When an opening is made into this cavity by the progress of caries, inflammation of the membrane ensues; which is increased by exposure to the air, saliva, &c. and occasions the familiar disease of toothache. The pain experienced during this affection is rendered the more acute from the circumstance of the unyielding nature of the walls of the canal not permitting of that distension which the increased size of the membrane would require.

#### THE GUMS.

The gum is a cartilaginous and highly vascular membrane, which surrounds the necks of the teeth, covers the alveolar pro-

cesses, and is thence extended to the lining membrane of the mouth, with which it imperceptibly unites. It consists chiefly of blood vessels, united with a cartilaginous tissue. The florid color of the membrane arises from the great number of the vessels. It is also by means of them attached to the bones, numerous small vessels passing between them.

Though one of the most vascular membranes in the body, it is not proportionably supplied with nerves, and is possessed of little sensibility when in a healthy condition; but when irritated, as during inflammatory affections, it often becomes exquisitely sensitive.

The natural sensibility of the gums is least in infancy, before the teeth have made their appearance; and in old age, after they are lost. At the latter period they appear sometime to lose almost all their power of feeling, as we often find aged persons masticating hard substances with their gums without the least inconvenience.

The use of the gums is to afford support to the teeth, nutrition and protection to the alveolar processes and adjoining parts of the maxillary bones—to all of which they adhere with a considerable degree of tenacity.

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#### CHAPTER IV.

##### OF THE ORGANIZATION OF THE TEETH.

*Of the Dental Blood Vessels—Evidence of Circulation in the Teeth—Of the Absorbent Vessels and Nerves of the Teeth—Intricate connection of the latter with those of other parts—Sympathy arising from this.*

THE arteries of the teeth are derived from the internal maxillary, a large subdivision of the external carotid. The teeth of the upper jaw are supplied by the superior maxillary and infra-orbital branches; the former of which entering the bone by one or two small openings at the back part of its tuberosity, traverses the maxillary antrum, ramifying on its lining membrane, and sends down small vessels to the molares, and usually to the adjoining bicuspidatus. The infra-orbital artery accompanies in its course the nerve of the same name, and sends down, while passing through the infra-orbital canal, small branches to the incisors, canines, and anterior bicuspidates.

The inferior maxillary artery is a large branch of the internal maxillary. Entering the jaw by the posterior maxillary foramen, it runs along the canal in the interior of the bone, giving off

branches to each of the teeth in its course; and afterwards emerging at the anterior foramen, it is ultimately distributed on the muscles and integuments of the lips, chin, and upper part of the neck.

On entering the teeth, the arteries generally unite with the nerves to form the delicate pulpy body which fills the dental canals. Frequently, however, they hold a separate course, and may occasionally be observed imbedded in the centre of the nerve, on cutting across a living tooth, or when one of the teeth has been accidentally broken over.

The blood is brought back from the teeth by corresponding veins, which usually follow the course of the arteries, and terminate in the internal maxillary vein—a branch of the external jugular.

#### CIRCULATION IN THE TEETH.

It has been much disputed whether the blood actually circulates within the substance of the teeth, as in the other osseous parts of the body. Almost all of those whose attention has been especially directed to the study of the teeth, believe that it does, while some of the most distinguished physiologists and anatomists of modern times affirm that the teeth are totally devoid of a circulation.

John Hunter was the first who questioned the vascularity of the teeth, in consequence of the result of some highly ingenious experiments which he instituted for the purpose of ascertaining the fact. The following are the grounds upon which he formed his opinion of their non-vascularity; but it will be observed that this was by no means so decided as is generally supposed.

“We cannot by injection prove that the bony part of a tooth is vascular; but, from some circumstances, it would appear that it is so; for the fangs of the teeth are liable to swellings, seemingly of the spina ventosa kind, like other bones; and they sometimes ankylose with the socket by bony and inflexible continuity, as all other contiguous bones are apt to do. But there may be a deception here, for the swelling may be an original formation, and the ankylosis may be from the pulp that the tooth is formed upon being united with the socket. The following considerations would seem to show that the teeth are not vascular: First, I never saw them injected in any preparation, nor could I ever succeed in any attempt to inject them, either in young or old subjects; and therefore believe that there must have been some fallacy in the cases where they have been said to be injected. Secondly, we are not able to trace any vessels going from the pulp into the substance of the new formed tooth; and whatever part of a tooth is formed, it is always completely formed, which is not the case with other bones. But what is a more convincing proof, is reasoning from the analogy between them and other bones, when the animal is



fed with madder. Take a young animal, viz. a pig, and feed it with madder for three or four weeks; then kill the animal, and upon examination you will find the following appearance: First, if this animal had some parts of its teeth formed before the feeding with madder, these parts will be known by their remaining of the natural color; but such parts of the teeth as were formed while the animal was taking the madder will be found to be of a red color. This shows that it is only those parts that were forming while the animal was taking the madder that are dyed; for what was already formed will not be in the least tinged. This is different in all other bones; for we know that any part of a bone which is already formed is capable of being dyed with madder, though not so fast as the part that is forming: therefore, as we know that all bones, when formed, are vascular, and are thence susceptible of the dye, we may readily suppose that the teeth are not vascular, because they are not susceptible of it after being once formed. But we shall carry this still farther: if you feed a pig with madder for some time, and then leave it off for a considerable time before you kill the animal, you will find the above appearances still subsisting, with this addition, that all the parts of the teeth which were formed, after leaving off feeding with the madder, will be white. Here, then, in some teeth, we shall have white, then red, and then white again; and so we shall have the white and the red color alternately throughout the whole teeth.

"This experiment shows that the tooth, once tinged, does not lose its color. Now, as all other bones that have been once tinged lose their color in time, when the animal leaves off feeding with madder, (though very slowly,) and as that dye must be taken into the constitution by absorbents, it would seem that the teeth are without absorbents, as well as other vessels.

"Another circumstance in which teeth seem different from bone, and a strong circumstance in support of their having no circulation in them, is, that they never change by age, and seem never to undergo any alteration, when completely formed, but by abrasion; they do not grow softer, like other bones, as we find in some cases, where the whole earthy matter of the bones has been taken into the constitution.

"From these experiments it would appear that the teeth are to be considered as extraneous bodies, with respect to a circulation through their substance; but they have most certainly a living principle, by which means they make a part of the body, and are capable of uniting with any part of a living body."

I have quoted from Hunter's Treatise, thus at length, for the purpose of giving a detailed view of a question that has been much misunderstood. It will be observed, that his opinion of the non-vascularity of the teeth was by no means decisive; and that,

at the outset, he even appears to have entertained an idea of their being possessed of a circulation. The arguments which he adduces in support of his theory are far from conclusive, and the majority of them might even serve for its refutation. For example, he says, that "the first consideration which leads him to suppose that the teeth are not vascular is, that they have never been injected, and that no blood vessels are seen to enter their structure." Now, this may arise, either from the materials which are commonly used for injecting the arteries, not being sufficiently fine to enter the minute vessels of the teeth; or from the circumstance that many of the arteries are so small as, in their ordinary condition, not even to admit the highly attenuated red particles of the blood, although they may do so on being distended during inflammation. This is every day seen in the instance of inflammation of the conjunctival membrane of the eye; the vessels of which, in their healthy state, are too diminutive to admit the red particles of the blood, though they readily do so on inflammatory distension, when the eye becomes what is termed blood-shot. And it is equally probable that if the unyielding osseous structure of the teeth did not prevent the dilatation of the vessels within it, we should also frequently find them charged with blood.

The experiment made on the animal is also inconclusive, as the madder may not have been administered for a period sufficiently long to have imparted a color to the portion of the tooth which had already been formed; although, from its presence in the blood, it may have tinged that part which was in the act of formation. Besides, even if it never did color the osseous substance of the teeth, it is not a proof that vessels do not exist in that structure. On the contrary, it may well be supposed, that those vessels which are usually impervious to the highly attenuated red particles of the blood, will naturally exclude any artificial coloring matter.

But the most extraordinary of all Hunter's arguments against the vascularity of the teeth, is his remark, that "it would seem that the teeth are without absorbents, as well as other vessels." Coming from such a quarter, this assertion will almost appear to be incredible; as Hunter was well aware, that not only are the roots of the temporary teeth removed by the absorbents, but also that the effects of these vessels are frequently evident upon the permanent teeth.

The opinion which Hunter retained of the non-vascularity of the teeth, is now almost universally considered to be erroneous; and all the best authors who, since his time have written on this subject, believe that the teeth are possessed of organization,

although perhaps not of so high an order as the other parts of the osseous structure.\*

Many conclusive arguments might be adduced, to corroborate the soundness of this opinion; but these are altogether unnecessary, as it is substantiated by actual observation. On extracting, and immediately afterwards cutting across a tooth, which has been in a state of high inflammation previous to its removal, small specks of blood will not unfrequently be discovered in its osseous structure, if it be examined with the microscope. These small vessels are sometimes still more strikingly apparent in cases where the teeth have been accidentally fractured.

I recently witnessed a case of a boy about twelve years of age, two of whose teeth had been broken over at their necks, by the blow of a cricket ball. The vessels in the canals not only bled freely, but several small red spots were distinctly seen on the osseous surface of the fracture; and these repeatedly re-appeared after being effaced by a sponge.†

\* From this remark, of course, many eminent writers on general physiology are excepted. I have already stated, that the majority of physiologists who have lived since the days of Hunter, aware of his profound research and accuracy on almost every subject, have generally followed his views, and denied the vascularity of the teeth. Mr. Lawrence, in his translation of "Blumenbach's Comparative Anatomy," has the following passage, which Mr. Bell calls "extraordinary," and well may do so. "The vascularity of the teeth," Lawrence says, "is a doctrine refuted by every circumstance in the formation, structure, and diseases of these organs."

I regret that on this point I have not the support of the distinguished lecturer, to whom I am indebted for whatever little anatomical knowledge I possess. Dr. Knox, an anatomist and physiologist of our own, not inferior to Lawrence, or to any of the age, I believe, retains the same opinion of the non-vascularity of the teeth. But it may well be supposed, that the deep attention which these gentlemen have bestowed on other parts of the system, more interesting to them, in a physiological point of view, than the teeth, may have prevented their observation being so minute as that of those whose avocations lead them almost exclusively to the study of these organs.

† Mr. Bell states, that he has made similar observations on cutting across teeth, shortly after their extraction. He also mentions an instance in which the teeth were completely tinged with a yellow color, in a person who had suffered from jaundice; and remarks, that "in those whose death has been occasioned by hanging or by drowning, I have invariably found the whole of the osseous part colored with a deep dull red, which could not possibly have been the case if these structures were devoid of a vascular system. In both instances, the enamel remains wholly free from discoloration."

The extraordinary case which the same gentleman details of finding a cavity filled with pus, in the interior of the osseous substance of a tooth, is, if possible, still more conclusive; it being, I believe, universally admitted, that pus cannot be deposited, except through the medium of the arteries.

## ABSORBENTS OF THE TEETH.

The absorbent vessels of the teeth are far more minute than those which convey their blood; indeed, I am not aware that they have ever been traced by the most patient anatomist. No doubt, however, can well be entertained of their existence, as their effects are every day strikingly apparent in the removal of the roots of the temporary teeth; and in the absorption of the sockets, and frequently also of the fangs, of the permanent set. From these circumstances, it would seem that the dental absorbents either exist in, or are intimately connected with, the membrane which surrounds the roots of the teeth and is thence reflected upon the interior of their sockets.

These vessels, small as they are, are in a state of perpetual activity, and eventually predominate over every other structure of the body; for absorption—that singular preparation made by nature for renewing the system, as well as insuring its ultimate decay—is always going on, although it is not until the meridian of life has been passed, that the arteries naturally cease to deposit new matter more rapidly than the absorbents remove the old.

## NERVES OF THE TEETH.

The nerves that are distributed to the teeth are branches of the fifth pair, of whose course it will be necessary to give a brief outline, for the purpose of explaining the source of the sympathy which exists between the teeth and other parts of the body, especially the head and face, to which this important nerve is the chief source of sensation. For a more minute description of the nerve itself, and the important functions it performs, I must beg to refer to the enlightened writings of Sir Charles Bell, whose highly original view of the nerves has excited the admiration of the present age, and will doubtless be considered by posterity as amongst the most splendid theories which any physiologist, of any era, has ever proposed to the world.

The fifth pair of nerves, on emerging from the brain, divides into three important branches:

- 1st, The ophthalmic nerve.
- 2d, The superior maxillary nerve.
- 3d, The inferior maxillary nerve.

The ophthalmic nerve, passing into the orbit, is subdivided into three or four branches.

1st, The orbitary, which, after giving off several small branches to the muscles of the eye, the eye-lids, and the lining membrane of the frontal sinus, passes through the supra-orbitary foramen, and is distributed on the frontal muscles and integuments of the forehead and temples, where it communicates freely with the branches of the portio dura of the seventh pair of nerves.

2d, The nasal nerve, which is chiefly distributed on the pituitary membrane of the nostrils, to which it is believed to communicate sensation, the olfactory nerves being supposed merely to indicate the sense of smelling.

The nasal nerve also distributes several small branches to the lachrymal sac, caruncula lachrymalis, &c., and a very minute but important twig, which, uniting with a small branch from the third pair of nerves, forms the lenticular ganglion, from which the delicate ciliary nerves arise.

The branches of the nasal nerve anastomose freely with those of the superior maxillary.

3d, The lachrymal nerve, which is principally distributed on the lachrymal gland, and the parts concerned in the production of the tears. This division of the orbitary nerve also gives off several small branches, which are distributed on the membranes of the eye, &c., and others that communicate freely with the branches of the superior maxillary.

#### THE SUPERIOR MAXILLARY NERVE.

The superior maxillary nerve, on entering the orbit, gives off several small and unimportant twigs, which are distributed on the adjoining parts; and, before passing into the infra-orbitary canal, gives off the following branches:—

1st, The vidian nerve, which forms the chief channel of communication between the nerves of the head and the great sympathetic nerve.

2d, The palatine nerve, the branches of which are distributed on the uvula, the soft parts of the palate, the gums, and the lining membrane of the mouth.

3d, The alveolar branch, which, after giving off several small branches to the muscular part of the cheek, and the lining membrane of the mouth, enters the maxillary antrum by several small openings in the posterior tuberosity of the bone, and ramifies on the lining membrane of that cavity. Small twigs of the nerve, dipping through the membrane and the osseous floor of the antrum, are distributed to the molares, and the adjacent small grinders of the upper jaw.

The upper incisors and canine teeth, with the first small grinder, receive their nerves from small branches, which the superior maxillary nerve gives off, in the course of its passage through the infra-orbitary canal.

The trunk of the superior maxillary nerve now enters the canal already mentioned, and emerging from it about half an inch below the inferior ridge of the orbit, is ultimately distributed on the muscles and integuments of the face; its branches communicating freely with those of the other divisions of the nerve, and the portio dura of the seventh pair.

It is this branch of the superior maxillary nerve which is subject to that mysterious disease, known by the name of *tic douloureux*. The intricate communication of its branches with many of the nerves of the head, and its direct anastomosis with almost all those of the face, will explain the cause of the violent suffering which is invariably experienced in these parts, when the trunk of the nerve is attacked by this peculiar irritation.

INFERIOR MAXILLARY NERVE.

The inferior maxillary nerve, the third and largest division of the fifth pair, passing out from the skull by the foramen ovale, holds a deep seated course. After distributing several unimportant branches to the adjoining parts, it divides into two highly important nerves.

1st, The gustatory nerve, which is distributed on the surface of the tongue, and believed to impart to it the sense of taste; the branches of the ninth pair of nerves, or *linguales*, ramifying chiefly on the muscular part of the organ, and supposed only to communicate to it the power of motion.

From the gustatory nerve is given off a very delicate but important branch, the *chorda tympani*, which, uniting with a branch of the *portio dura* of the seventh pair, establishes a direct communication between the inferior maxillary nerve and the internal ear.

2d. The proper maxillary nerve, which, entering the inferior maxillary bone by its posterior foramen, extends along the canal that exists in the centre of the bone. In its course it gives off branches to each of the teeth in succession, and afterwards emerging by the anterior foramen, is ultimately distributed on the muscles and integuments of the lips, chin, and upper part of the neck.

These branches communicate freely with those of the superior maxillary and other nerves of the face, and also with the ramifications of the cervical nerves.

The three inferior molares and adjoining small grinder, are supplied by twigs which the nerve gives off in its course through the maxillary canal; and the first small grinder, with the canines and incisors, receive their nerves from a branch which the trunk of the nerve sends forward, before leaving the bone by the anterior foramen.

## SYMPATHY BETWEEN THE TEETH AND THE OTHER PARTS.

From the above outline of the course of the fifth pair of nerves, and of their extensive and intricate connection with almost all those of the face and head, it will be evident from what source the sympathy arises which is so often exhibited by these when the teeth are affected by disease. Thus, when the nerve of a tooth is in a state of irritation, the pain is rarely confined to the seat of the disease; but is usually extended to the face, and the head in general, giving rise to painful swelling of the cheeks, suffusion of the eyes, headache, and frequently to severe inflammation of the internal ear. Earache, indeed, will often be found to arise solely from the presence of a carious tooth, in which perhaps there is very little pain. Hence, when there is any irritation of that delicate organ, it is well to make a careful examination of the mouth, and if any tooth, which from its situation is likely to be the cause of the auricular pain, is observed to be carious, its removal should be effected, and the operation will generally afford relief to the ear.

The pain arising from inflammation of the adjoining parts is, on the other hand, occasionally communicated to the teeth. This is especially observed in cases of *tic douloureux*, which was at one time supposed to arise from irritation of the dental nerves. The teeth were often, on this supposition, extracted one after another, though perfectly healthy and sound, until the whole of them had been removed, without affording any permanent relief. The dreadful suffering experienced by the victims of this disease, is now known to arise from a peculiar affection of that large branch of the nerve which is distributed to the muscles of the face, the *infra-orbitary*. From this trunk, it has been already stated, the superior dental nerves arise; and hence the pain is thus extended to the teeth, although they are only secondarily affected.\*

\* These remarks will also show how imperatively necessary it is that every dentist who desires to practise his profession with advantage to his patients and honor to himself, should have a regular surgical education.

"That ignorance and quackery," Mr. Bell observes, "have usurped as high a seat, and exercised as sovereign a sway in this as in any other department, is a truth against which, with the examples surrounding us on every side, it is impossible to close our eyes."

I regret to be obliged to add that this is but too much the case, and that a great majority of those who style themselves "Surgeon Dentists," consist of persons who have originally followed avocations widely different. It is scarcely to be supposed that their former pursuits could have contributed much to their scientific or surgical knowledge; and yet such persons, daily, through the medium of the public prints, push themselves into notice, with an assurance that is only to be equalled by the daring rashness which they evince in what they term "Dental operations carefully performed;" but which can only be designated as the barbarous and ignorant malpractices of quackery.

## CHAPTER V.

## CLASSIFICATION OF THE TEETH, AND GENERAL DESCRIPTION OF THE RESPECTIVE CLASSES.

*Of the Incisors—Canines, or Eye Teeth—Bicuspides, or small Grinders—and Molares, or large Grinders.*

THE teeth are divided into four classes, namely, incisors, canines or eye teeth, bicuspides or small grinders, and molares or large grinders. The whole of these classes exist both in the temporary and permanent sets, with the exception of the bicuspides, which are only to be found in the second set of teeth. To the permanent set the following description will be chiefly directed, as their classification is not only much more complete, but the teeth themselves are more strikingly marked, and of greater importance than those of the temporary set.

These different classes of the teeth are arranged in the mouth in the order in which they have been named,—the incisors occupying the anterior part, and the molares the posterior extremities of the maxillary bones; and both differing as widely from each other in form and appearance as they do in their respective situations. The canines and bicuspides are placed between them, and present an aspect intermediate to both. The different classes of the teeth thus exhibit a regular gradation, from the gracefully formed and sharp edged incisor, to the large and rhomboidal figure of the grinding teeth.

## OF THE INCISORS.

The incisors are eight in number, four of them being situated in the front part of each maxillary bone. The two anterior teeth receive the name of central incisors, from being placed on each side of the mesial line of the face; an imaginary line parallel with the frænum of the lips, or the division of the nostrils, and considered as the centre of the mouth.

The other two incisors are termed laterals, from their position by the side of the centre teeth; on the outer edge of each of which a lateral incisor is placed.

The centre incisors of the upper jaw are the largest of any of this class of teeth; and are considerably more so than the adjoining laterals. In the under jaw the reverse of this occurs, the centre teeth being there somewhat less than the lateral ones, and the whole of them considerably smaller than those of the upper jaw.



All of the permanent incisors are of a much greater size than the corresponding teeth of the temporary set. When first formed, they are situated behind these; but in proportion as the fangs of the first set are removed by absorption, the bodies of the second advance forwards, and if they perforate the gums in a regular direction, they ultimately occupy a position considerably more prominent.

The whole of the incisors are single-rooted teeth. Their fangs are generally long, and of a conical shape, gradually tapering to the extremity. Those of the laterals of the upper jaw are frequently bent, or have a hook-like termination, and are somewhat flattened, or perhaps hollowed on their sides, while the central ones are nearly round. The under incisors, again, are all more or less flattened on their sides, and the laterals are considerably hollowed.

From the length of their roots, the attachment of these teeth to their sockets is strong and firm; though, like all the other single-rooted teeth, they are capable of a slight degree of motion in every direction. This arises from the compression of the elastic membrane that is interposed between them and their sockets, and materially contributes to their permanency by diminishing the shock of any sudden blow which might otherwise splinter the alveolar processes, or fracture the teeth.

The bodies of the incisors, on their anterior aspect, present the appearance of a well formed oval, somewhat flattened at the sides, and always so at the edges, in the adult teeth. When the teeth first perforate the gum, their edges usually have a notched or serrated appearance, which, however, is soon removed by their contact with each other; and they ultimately become nearly level and flat. That edge of the tooth which is nearest to the centre of the mouth is generally more pointed than the lateral one; and this feature, in union with the more prominent development of the teeth on the central aspect, will always serve to distinguish an incisor of the right side of the mouth from one of the left.

When looked at in a lateral direction, the incisors have a wedge-like appearance; a form which is well adapted for *cutting*, the purpose for which these teeth were intended, as their name denotes.

The enamel of the incisors is thickest and strongest on their edges, and anterior and posterior surfaces, where they are most exposed to be worn down by friction. On their sides it is much thinner, as they are there almost completely beyond the reach of that influence, by being placed in contact with each other: although it is here where they generally first give way, caries very frequently commencing on the sides of these teeth, in consequence

of the enamel being crushed by their pressure on each other. To this disease, however, the incisors are among the least liable of any of the teeth, and especially those in the under jaw.

The use of the incisors is, to divide substances previous to their being comminuted by the larger teeth. They also greatly contribute to the distinctness of articulation, which is always much impaired when any of these teeth have been lost.

The temporary incisors usually perforate the gums between the fifth and tenth months; the permanent ones from the sixth to the eleventh year.

#### OF THE CANINE, OR EYE TEETH.

The cuspidati, or canines, are four in number. They are placed next to the incisors, one on the outer side of each lateral; and are intermediate in their general appearance, as well as in position, between these and the bicuspidates. They are the largest of any of the single-rooted teeth, and generally the strongest and most prominent of the set.

These teeth have received the name of canine from corresponding to those that are so strikingly developed in the dog, and other carnivorous animals, and are used for the same purpose as these, namely, seizing and tearing asunder substances prior to their comminution by the grinding teeth.

They are popularly termed eye teeth, from a mysterious connection that has been supposed to exist between them and the organ of sight. This opinion, like many others of a similar nature, is unquestionably erroneous, as no communication can be traced between the two. In the under jaw, their position renders it impossible that they can have any nearer connection with the eye than the adjoining teeth have; and if that organ is occasionally affected by the extraction of a canine of the upper jaw, it must be owing to the great length of their roots, which approach nearer to the orbit than those of any of the other teeth.

The canines have generally only one root, though in the under ones the rudiments of two may be occasionally observed. Their fangs are always the largest of those of any of the teeth, and are generally considerably flattened, or hollowed, on their sides. The root is seldom straight, and frequently has a hook-like extremity. From these circumstances, and their great length, they have a very firm attachment to their sockets, and generally remain longer in the mouth than any of the other teeth.

The bodies of the canines are exceedingly strong. Their edges are more rounded than those of the incisor teeth, and usually terminate in a sharp prominent point, a feature which they almost invariably retain to the last. On their posterior aspects, especially in those of the upper jaw, another smaller prominence will gene-

rally be seen, indicating an approach to the formation of the grinding surface.

The enamel of the canines is of great thickness on their points, and on their anterior and posterior surfaces. It frequently has the serrated appearance on its edge, or may exhibit two or more distinct points here, when the teeth perforate the gums.

The canines are less liable to become diseased than any of the other teeth; and, on the whole, may be considered as the most perfectly formed and important of the set; as, from their great strength, they are more frequently used than any of the others; and by their prominent position, they materially contribute to preserve the natural shape of the jaws, which always undergo a considerable contraction when these teeth have been removed.

The temporary canines usually appear between the fourteenth and twenty-first months: and the corresponding permanent ones between twelve and fourteen years of age.

#### OF THE BICUSPIDES.

The bicuspidés, or small grinding teeth, are eight in number; four of which are placed in each jaw, between the canines and the molares. They are intermediate between these teeth in their functions and general appearance, as well as position.

They have received the name of bicuspidés, or bicuspidati, from having two distinct points on their crowns. These prominences are seen on their anterior and posterior edges, and are most strikingly marked in the teeth of the upper jaw, where both are nearly equally prominent. In the under jaw, these points are not so equally large; the anterior one being prominent and well marked, while the posterior one is much smaller, and situated considerably lower down. Between the prominences there are, of course, corresponding depressions; and the whole are so formed, that, when the teeth approximate, the anterior points of the under bicuspidés enter into the sinuosities between those of the upper; and the posterior prominences of the upper teeth enter into the depressions of the under, while their anterior edges overlap these teeth in front. The crowns of the opposite teeth are thus in close contact when the jaws approximate, and although they are well protected by a thick enamel, they often become completely flat and smooth by the continued friction,

The bicuspidés have usually only one root, although they often have the appearance of two, or sometimes of three united. Occasionally, however, the first small grinder of the upper jaw has two distinct fangs, which is sometimes, though more rarely, observed in the corresponding under tooth.

It has been already stated, that this class of teeth is peculiar to the permanent set, and that they do not exist in that of the child.

During their formation, their bodies are situated between the diverging fangs of the temporary molares, whose places, on penetrating the gums, they occupy; and, from being of a smaller size than these, they afford more space in the jaws for the larger permanent incisors and canines.

The bicuspidæ usually make their appearance between the thirteenth and fifteenth years of age.

#### OF THE MOLARES, OR LARGE GRINDERS.

The molares are twelve in all, three being arranged on the right and left sides of each jaw. The posterior of the three is termed the *dens sapientiæ*, or wisdom tooth, from being considerably later in appearing than any of the others.

The bodies of the molares are much larger than those of any of the set, and are surrounded by a thick layer of enamel, which is especially abundant on the crowns of the teeth. The crowns are also marked by many prominent points and depressions, by means of which the substances, which are submitted to their action, are more easily comminuted. The prominences of the under jaw usually correspond to the depressions in the upper, and *vice versa*.

These inequalities on the crowns are most conspicuous when the teeth first perforate the gums. As the individual advances to age, they become gradually effaced by the perpetual friction; and in old persons, especially in those who have subsisted on hard substances, such as biscuits, &c. the surfaces of the teeth are generally completely smooth.

These depressions on the crowns of the molares, although they contribute greatly towards facilitating mastication, yet render these teeth more liable to become carious than any of the others; particles of the food being readily entangled by them, and when allowed to remain, undergoing decomposition on the crowns, where caries is most frequently observed to commence.

The molares are firmly attached to their sockets by a number of strong diverging roots. In the upper jaw, the two first teeth always have three distinct fangs; two of which are placed on their outer, and one on the inner side. The corresponding under teeth have usually only two roots, and these do not diverge so much from each other.

The wisdom teeth have generally only one fang, especially in the upper jaw, though this often presents the appearance of several united.

Considerable variety, however, exists in the number of the roots of the whole of these teeth, and cases of four or even five distinct fangs may occur.

The molares of the child are only eight in number; the first

one usually appears between the tenth and twelfth months, and the second about the end of the third year, when the temporary set of teeth is completed.

The first of the permanent large grinders generally perforates the gum about the end of the fifth year; the second about the age of fourteen; and the wisdom teeth rarely until eighteen or twenty years of age. They are often much later in appearing, and cases are on record in which they have not advanced until the fiftieth or sixtieth years; and others, in which they never came forward at all.

## CHAPTER VI.

### OF THE TEMPORARY AND PERMANENT SETS.

*Of the Temporary Teeth—Period of their Appearance, and order in which they advance—General Description of them—Shedding of the Teeth—Preparations of Nature for it—of the Permanent Set—Order in which they Appear—their position in the Maxillary Bones—Appearance of these when the Teeth are completed—of Supernumerary Teeth—Impossibility of the existence of a third set.*

THE temporary set of teeth are twenty in number; consisting of four incisors, two canines, and four molares in each jaw.

The formation of these commences as early as the fourth month of the foetal existence, and the whole of them are developed in the maxillary bones at the period of birth; although they do not, in general, make their appearance externally until several months afterwards.

The teeth are usually first seen when the child is between six and seven months old. Frequently, however, they appear as early as the fourth month; and on other occasions, a whole year after birth may have elapsed, before any of them have perforated the gums. It is generally observed, that a healthy child obtains its teeth at an earlier period than a delicate one; although this is not invariably the case.\*

\* "The absolute absence of teeth for the first six or seven months, clearly points out the impropriety of introducing any solid food during that period; and by those who take nature for their guide, will be deemed sufficient to induce them to restrict infants to that food which has been so bountifully provided for them, and for which alone the delicate state of the digestive organs is at first adapted."—Bell on the Teeth.

## ORDER IN WHICH THE TEMPORARY TEETH APPEAR.

The under teeth almost always perforate the gums before the upper ones; and in both jaws they advance in pairs, one tooth appearing on the right or left side of the centre line, and either accompanied, or in the course of a few days followed, by the corresponding one of the opposite side.

A central incisor of the under jaw is generally the first tooth that is obtained. It is usually observed about the sixth or seventh month, and is immediately afterwards followed by its fellow. The corresponding teeth in the upper jaw make their appearance in the same manner, in the course of a few weeks.

The under lateral incisors next advance, about the eighth or ninth month; and are soon afterwards followed by the corresponding upper ones. The whole of the incisors are thus usually seen when the child is nine or ten months old.

The canine teeth, which in arrangement are situated next to the incisors, are so much more deeply placed in the maxillary bones, that they seldom make their appearance until the fifteenth or sixteenth month; and are preceded by the first grinding tooth, which is usually present on both sides, above and below, when the child is one year old.

The second temporary grinding teeth are considerably later in appearing, and seldom perforate the gums until the end of the second or beginning of the third year. When these teeth are obtained, the temporary set is completed.

## REMARKS ON THE TEMPORARY TEETH.

The temporary set of teeth do not differ materially from the permanent in their structure and general appearance. They are, however, much smaller, and more delicately formed; and, as their name implies, are not nearly so durable. They remain but a few years at the utmost, and often begin to decay almost as soon as they perforate the gums.

The pain which this premature caries gives rise to, is rarely so acute as it is in that of the permanent set, although it may sometimes be so severe as to render the extraction of them imperatively necessary. But it should be the object of the dentist to postpone the operation as long as possible, as the preservation of these teeth is essential not only to the health of the child, but also to the proper formation and regular position of those that are to succeed them.

About the fifth or sixth year of age, the roots of these teeth are removed by absorption; the dental absorbent vessels being stimulated either by the pressure, or by the advance, of the bodies of the permanent teeth. When the fangs are thus removed, the teeth,

being deprived of their support, become loose, and eventually drop out. When this occurs, their necks have sometimes a splintered appearance, as if the teeth had been broken across; although in general the removal of the fangs is so completely effected by absorption, as to give rise to the popular but erroneous opinion that the temporary teeth have no roots.

Occasionally, however, the fangs of several of these teeth seem to escape the action of the absorbents, and these may then remain firm in their sockets for many years. This occurrence will, of course, prevent the corresponding teeth of the permanent set from advancing at the proper period; although they may afterwards appear when the temporary ones have been removed in the course of time in the usual manner.

I have no doubt that it is invariably from this occurrence that those anomalies of the appearance of new teeth at an advanced period of life proceed, which are erroneously considered as part of a third set. As an instance of this, I may mention the following case:

About a year ago, I met with a gentleman, upwards of forty years of age, who still retained some of the temporary incisors of the lower jaw, and the canines of the upper. One of the latter required to be removed on account of the pain which caries of it gave rise to; and its root was found to be quite entire and sound. I persuaded the gentleman, contrary to his own inclination, to have no artificial tooth put in its place; and the advice has been justified by the event, as he has recently informed me that a new tooth is now making its way through the gum.

#### SHEDDING OF THE TEETH.

The first set of teeth are, from the delicacy of their structure, evidently designed solely for the earlier years of childhood, and are soon to be replaced by others more adapted for the purposes of maturer age. The period at which this interesting change occurs, ought always to be regarded with much attention by those to whose care the child is intrusted, as the perfection of the speech, the beauty of the lower part of the countenance, and, to a certain extent, health in general, are in a great measure dependant on its successful completion.

There is perhaps no occasion in which the hand of nature is so strikingly displayed in the animal economy, as in the provident preparations which are made for substituting the large and durable permanent teeth, for the small and delicate temporary set. At a considerable period before that at which the permanent teeth are destined to appear, the maxillary bones may be observed to be gradually increasing in size, and becoming much altered in form. The temporary teeth, which had formerly been close,

now separate from each other; and the maxillary bones, which had hitherto been of a semi-circular figure, whose breadth was greater than its length, now become more elongated, and assume the appearance of an elliptical arch or semi-oval, the diameter of which is greatest from its anterior to its posterior extremities. The under jaw, which had always been wider than the upper, now also begins to project beyond it in front, giving rise to that prominence of the chin, and lengthening of the face, which mark the transition from childhood to a more advanced period of youth.

The first external appearance of the shedding of the teeth, is usually observed about the sixth or seventh year of age, although the period is subject to considerable variation. The process, however, had been going on for a long time before, as the rudiments of several of the permanent teeth were present within the jaws at birth; and the formation of the others advances with that of the temporary teeth, until the fifth or sixth year, when the bodies of all the permanent set, excepting the wisdom teeth, are developed in the maxillary bones, and the temporary ones are about to leave them.

The head of a child of this age will afford a remarkable appearance, as forty-eight teeth (twenty temporary, and twenty-eight permanent) are then present in the jaws, if none of the first set have been removed.

To those who have not examined the subject, it will appear almost incredible, that the small size of the maxillary bones at this period could afford the space requisite for so many teeth; nor indeed would it be possible for them to contain the half of the number, were it not for the peculiar and provident mode in which they are arranged.

At this early age, the bodies of the maxillary bones are little more than a series of shells, in consequence of the number of the sockets of the teeth. The permanent incisors are then situated behind the corresponding temporary ones; the canines and small grinders deeply under the orbit; the bodies of the latter generally lying within the space that is formed by the diverging of the roots of the temporary molares; while the first and second permanent molares occupy that space which the maxillary bones acquire by their increased elongation.

In proportion as the bodies of the permanent teeth advance towards the surface, the fangs of the temporary ones are removed by the absorbent vessels, stimulated probably by the pressure. But the permanent teeth do not occupy the sockets of the temporary ones, as is generally believed; for those of the latter are gradually removed in proportion as the absorption of the roots goes on, and new sockets, as well as new teeth, are created to succeed them.



The temporary teeth generally drop out in nearly the same order in which they advanced, and are quickly succeeded by the permanent set.

#### OF THE PERMANENT SET OF TEETH.

The permanent set of teeth are thirty-two in number; there being in each jaw four incisors, two canines, four bicuspidæ, and six molares. The mode in which they are formed has been already generally described; and I have now chiefly to notice the singular connection which subsists betwixt them and the temporary set.

The second set of teeth may be considered as the offspring of the first; for shortly after the appearance of the pulp which constitutes the germ of the temporary tooth, a small process, consisting of portions of the rudimentary body and its investing membranes, shoots out from it; which, at first even more delicate than the trunk from which it sprung, and entirely dependant on it for support, eventually becomes the dense and strong permanent tooth.

These rudiments of the permanent teeth are at first contained in the same cells with the temporary pulps; but are eventually placed in distinct sockets of their own, formed by absorption in the interior of the maxillary bones. A communication, however, still subsists between them, by means of the *cervix* of the original process; which becoming gradually elongated, remains attached by one extremity to the sac containing the rudiments of the permanent, and by the other to the neck of the temporary, tooth and the gum surrounding it. It is from the latter source that the vessels of the vascular membrane, which then surrounds the rudimentary pulp, proceed, and afford nutrition to the capsule and its enclosure.

This singular communication between the two sets of teeth may be traced as late as the third or fourth year of age, and there is reason to suppose that it exists almost until the period at which the first set of teeth is ready to give place to the second. It will prove what injurious consequences to the permanent teeth may result from the barbarous, empirical practice of prematurely removing the temporary ones, for the pretended purpose of preventing irregularities of the second set.

#### ORDER IN WHICH THE PERMANENT TEETH APPEAR.

The permanent teeth occupy a period of at least eighteen years for their completion—several of them being present at birth, and the last of them, the *dentes sapientiæ*, not appearing until the adult age.

The first teeth of the second set that perforate the gums are usually the anterior molares. These may generally be observed, in both jaws, about the end of the fifth year, before any of the temporary teeth have been shed; and they usually come in so easily, that it frequently happens that neither the child nor its attendant is aware of their existence.

The two central incisors of the under jaw next appear—the one generally preceding the other by a few days. They are shortly afterwards followed by the corresponding upper teeth, which are usually present between seven and eight years of age.

The lateral incisors, below and above, come forward, in the same order, in less than a year afterwards.

The anterior bicuspidæ are generally the next teeth that advance. They usually appear about the eleventh year, and precede the posterior ones by nearly twelve months.

The canines, from the deep situation they occupy, the upper ones being placed immediately under the orbit, and the under near the base of the jaw, are seldom seen until twelve years of age. They are generally accompanied by the second bicuspidæ.

The second molares are observed about the end of the thirteenth year; and for the present complete the permanent set.

The posterior molares, or wisdom teeth, do not perforate the gums until the nineteenth or twentieth year. The period of their appearance is very irregular. They are often much later in advancing; and cases are known in which they have not appeared until the fiftieth or sixtieth year, and others in which they never came forward at all.

#### RELATIVE POSITION OF THE PERMANENT TEETH TO THE MAXILLARY BONES.

At the time that the permanent set of teeth are completed, the maxillary bones will also be found to be fully formed. The increased depth of the under jaw, and its prominence in every direction, but especially in front, over the upper, will now be observed. These give rise to that projection of the chin, and lengthened or oval appearance of the face, which are almost always observed in the adult person.

But this great prominence of the under jaw would interfere with the performance of mastication, and produce deformity, were it not counteracted by the relative position of the teeth. These, in the lower jaw, have a considerable inclination inwards, and fall within the line of the upper ones, which project in the opposite direction, and overlap them in front, while, posteriorly, the teeth meet in nearly a parallel line when the jaws approximate.

This arrangement of the under teeth within the circle of the upper, is always observed in a well formed mouth, and is neces-

sary, not only for the symmetry of the face, but also for the preservation of the teeth. For if the reverse occurs, and the under teeth project beyond the upper, considerable deformity of the countenance is generally observed; and if the opposite teeth meet each other exactly in a line, they are always rapidly worn down.

#### OF SUPERNUMERARY TEETH.

Before closing the description of the permanent teeth, it will be necessary to notice a class of supernumerary ones which occasionally appear along with them.

These teeth, like other similar structures, arise from accidental formation, and will be always readily distinguished by their imperfect appearance, which somewhat resembles that of an ill formed lateral incisor of the upper jaw, or one of the inferior bicuspidæ. The position which they occupy is as irregular as their appearance, as they are sometimes seen between the upper incisors, or placed behind them. In other cases, they are situated at the posterior part of the jaw, and occasionally in the roof of the mouth. They are invariably productive of great deformity and inconvenience, and should be removed as soon as they are discovered.

#### IMPOSSIBILITY OF THE EXISTENCE OF A THIRD SET.

Before concluding this part of the work, it may be well to allude to the supposed existence of a *third* set of teeth, of which we frequently hear, and even find some persons sufficiently credulous to believe in. Doubtless there are several well authenticated cases of teeth coming forward at an advanced period of life; but these are no new formation, but merely part of the second set, whose progress may have been for a time retarded by the non-absorption of the roots of the temporary teeth, or some similar obstacle, although they may afterwards make their appearance when these have been removed. This appears to be the only way of accounting for their occasional occurrence; for the idea of the existence and advance of a third set of teeth after the second have been removed, is so diametrically opposed to every principle of physiology, that I shall not believe in it, until it is substantially proved that the head will again spring from the shoulders after the individual has undergone the ordeal of the guillotine.

# THE DENTAL SCIENCE

## PART II.

### THE IRREGULARITIES AND DISEASES OF THE TEETH, &c.

#### CHAPTER I.

##### OF IRREGULARITIES OF THE TEETH AND THEIR TREATMENT.

IN a former chapter, it was mentioned that, in a well-formed mouth, the teeth presented the appearance of a graceful semi-elliptical arch; and that the under ones were overlapped by the upper in front. They do not, however, always perforate the gums in this regular order: the smallness of the maxillary bones at the time the second set come in, the great size of the permanent teeth, compared with those which preceded them, and the situation of part of them on the inner, and of others on the outer, side of the temporary ones, before they advance to the surface—all tend to prevent their assuming a regular position.

In describing those irregularities which most frequently occur, I shall mention the mode of treatment peculiar to each; but a few preliminary observations will be necessary on the principles which ought in general to direct it.

As irregularity of the teeth almost always arises from the resistance which they meet with in their progress to their position, it can only be obviated by the removal of this, or by counter pressure. The mode of treatment adopted for this purpose will prove the difference between the practice of the scientific and honorable practitioner, and the ignorant and unprincipled charlatan.

As the resistance is generally occasioned by the temporary teeth, the empiric almost invariably resorts to the premature removal of these, for the purpose, as he says, of preventing irregularity. With this view, he will unhesitatingly recommend, and (if permitted) accomplish the extraction of the temporary teeth, a considerable time before the permanent ones are ready to succeed them.

Notwithstanding the gross ignorance and cruelty evinced in such practice, it is, I regret to state, by no means unfrequent to meet with cases where parents have been thus persuaded to allow

these barbarians to remove by violence, the greater number of their children's teeth, to the torture of the unfortunate little patients, at the period of this maltreatment, and, in all probability, to their lasting injury for the future.

It is impossible to deprecate too strongly the cruelty of such a course, which will never be followed by any but the most ignorant and heartless empiric. On the contrary, it will always be the aim of the enlightened practitioner to preserve the temporary teeth as long, and to extract them as seldom, as possible; not only because it is highly desirable to avoid operating on patients of such early years, but also from the presence of these teeth being necessary for the requisite expansion of the maxillary bones, and the proper development of the permanent set.

There are many cases, however, in which it becomes imperatively necessary to extract some of the temporary teeth; as, for example, when their roots have not been removed by absorption in proportion to the advance of the bodies of the permanent, when these will appear on the inner side of the first set, and thus exhibit the appearance of two rows of teeth; or they may come in with their sides directed forwards from want of the requisite space. Such irregularities can never be corrected unless the temporary teeth are extracted, although the operation ought to be considered as only the lesser evil of the two.

I shall now shortly detail the mode of effecting counter pressure.

The instrument by which this is accomplished is an invention of John Hunter, and is undoubtedly one of the most useful of all those which his prolific genius suggested. It has been subsequently recommended by Fox, Bell, and all the best writers on the subject, and, I believe, is adopted by every eminent practitioner. There are persons, I am aware, who pretend to have discovered better means of treating these affections; but as they have not thought proper to divulge them, their assertions may well be supposed to be unworthy of credit, and their boasted contrivances incapable of use. And yet these are the individuals who rail at the simplicity of Hunter's ideas, which is no doubt very uncongenial to their own tortuous courses.

The instrument suggested by Hunter consists merely of a curved gold or silver bar, adapted to the arch of the mouth, and the position of the teeth. It should extend from one extremity of the jaw to the other, and be fixed to the outsides of the posterior or strongest teeth, by means of ligatures attached to them, and tied, after being passed through two small openings in the bar. Another ligature being applied in the same manner to the irregular tooth, is to be firmly tied in front of the gag, and renewed every two or three days, until the tooth is brought forward, which will usually be accomplished in the course of a fortnight or three weeks, without much inconvenience to the patient.

It is usually necessary to have two small metallic plates attached to the lower edge of the bar, and afterwards bent horizontally. To each of these a small square piece of ivory is to be fixed by a screw and rivet, and interposed between the opposite grinding teeth, to whose crowns the surface of the bone ought to be made to correspond. The object of this modification of the bar is to prevent the teeth meeting when the jaws approximate; and it is invariably necessary in those cases in which the under teeth advance in front of the upper. When the latter have been brought forward beyond the counteracting influence of the former, the simple bar may be substituted, and allowed to remain attached to the teeth for a few days, until they become firm in their new position.

By means of the pressure of the bar, any of the teeth that are unduly prominent, may at the same time receive an inward inclination, although this is a description of irregularity which is infinitely more difficult to cure.

In those cases in which the sides of the teeth project in front, a somewhat different contrivance will be requisite. A small plate is to be accurately adapted to the irregular tooth, in the form of a cap. To this a bar is to be attached, and tied, at one extremity of the posterior surfaces of the teeth of one side, and by the other, to the anterior of those of the opposite—the bar being thus placed behind the teeth on one side, and in front of them on the other. A powerful lever will thus be made, and, if properly applied, it will turn round the tooth in the course of a few days.

These modifications of the bar will be found sufficient for effecting the cure of almost all the cases of irregularities that are usually met with. Particular instances, however, may occur in which it may be necessary to construct gags of a somewhat different form, which the dentist will readily be enabled to suggest, if he possess but ordinary dexterity.

But great as the benefit is which may be derived from the bar, I do not feel inclined, in every case, to trust exclusively to the use of it, or believe that it will always supersede the necessity of extraction. There are instances in which, as I have already mentioned, the operation becomes imperatively requisite. Of these the practitioner must judge, and in deciding on the course he is to follow, he will do well to steer clear of either extreme; keeping in view, that, although none of the temporary teeth should be removed unless it is urgently called for, it is better to anticipate, by a short time, an operation which will soon be performed by nature itself, than to allow a permanent irregularity of the second set to occur.

It frequently happens, that, notwithstanding every care on the part of the dentist, irregularities, or "crowding" of the permanent

teeth, will happen, in consequence of the great size of the teeth, and the small dimensions of the jaws. In such cases, it is customary with many, to remove one or more of the most irregular teeth, with the view of affording room to the others, and in the expectation that these will so close together as to remove all appearance of the vacancy. In this practice I am not disposed to concur; as, even if the irregularity should be thus removed, (which is not invariably the result,) the want of the teeth is always evident, and occasions a contraction of the jaws, which materially impairs the symmetry of the face. There are instances, indeed, as in the case of the upper canines, when they perforate high up on the anterior surface of the jaw, in which early extraction will be necessary; but in general, the operation ought to be avoided, or at least postponed until it is seen whether the enlargement of the maxillary bones will not afford the requisite space.

#### IRREGULARITIES OF THE DIFFERENT TEETH.

The irregularities of the teeth are so various, and in almost every case present such different appearances, that it is scarcely possible to give any description of them. I shall endeavor, however, to enumerate those that most frequently occur, and, at the same time, mention the treatment which is adapted to each.

#### IRREGULARITIES OF THE INCISOR TEETH.

The permanent central incisors of the under jaw occasionally appear before the roots of the corresponding temporary ones have been removed by the absorbents. In this case they always take up their position on the inner side of these, and thus occasion the appearance of a double row of teeth. The lateral incisors sometimes advance in the same direction; but it more frequently happens that these teeth come in edgeways, or with their sides inclining forwards.

Both of these irregularities proceed from the same cause—want of room for the rising teeth, in consequence either of the tardy absorption of the roots of the temporary ones; or, if these have been removed by nature in the ordinary way, from the space which they left being too small for their permanent successors.

In either case, the extraction of the adjoining temporary teeth will be necessary. The permanent ones will then generally of themselves come forward; though the application of the bar will sometimes be required to bring them into a regular position.

The superior incisors are still more frequently irregular, in consequence of their greater size, and the smallness of the space for their reception. The centre ones occasionally perforate the gum in the same unfortunate position, behind the temporary teeth. A similar mode of treatment must be adopted to bring them forward;

and it will generally be necessary to prevent the approximation of the jaws, by the interposition of the ivory.

The lateral incisors of the upper jaw are more frequently irregular than any of the other teeth. They sometimes perforate nearly behind the posterior sides of the centrals, and on other occasions, almost directly in front of their anterior surfaces. If the former occurs, the bar with ivory must be used; if the latter, they may be drawn aside into a more regular position by a ligature attached to the posterior teeth.

A totally different kind of irregularity is often observed in the upper incisors. The teeth in this instance, instead of being crowded together, perforate the gums widely apart, and diverging from each other. The spaces thus left between them are frequently so large as to lead a casual observer to believe that some of the teeth are wanting. At other times they may contain supernumerary teeth.

In both instances ligatures should be applied to bring the teeth nearer to each other, not only to remove the unfavorable appearance, but to afford the space which is required for the regular advance of the posterior teeth. If any supernumerary teeth are present, it will be necessary to remove them.

I need scarcely caution the practitioner against committing the deplorable mistake of removing the permanent, instead of the temporary or supernumerary teeth. This, however, has not unfrequently been done by ignorant or careless persons. It is a blunder of the most serious and unpardonable description, and can never occur with a man of ordinary care and observation.

The canine teeth are very often the subjects of an almost incurable irregularity—a preternatural projection. This partly arises from their great size, and the small space that is usually left for them, in consequence of all of the anterior and most of the posterior teeth having usually taken up their position before the canines perforate the gum; and it seems also partly to proceed from a natural tendency which these teeth have to project; as they are often observed to be irregularly prominent when there is abundance of room for them, and no apparent obstacle to have prevented their assuming a regular position.

When they advance with this projecting tendency, they usually perforate at the deepest part of the alveolar process, immediately below the junction of the gum with the lining membrane of the lips. In this unfortunate position, it is almost impossible to direct them inwards. The bar is here of no use whatever: some benefit may perhaps be derived from frequent pressure with the finger; though the remedy, by this means, is so protracted, that the patient will generally be desirous to have them extracted, in consequence of the deformity they occasion, and the inconvenience,



and even danger, to the lips, which their projection is apt to produce.

When the irregularity of the canines assumes the form of an unnatural inclination inwards, which, however, rarely occurs, it is to be treated with the bar in the ordinary way.

The small grinders often advance in a very irregular direction : in the under jaw, penetrating deeply, and sometimes extending in nearly a horizontal direction from the inner or lingual side of the bone ; and, in the upper, generally projecting, like the canines, but sometimes appearing on the palatal side. The impediment and danger to the motions of the tongue and lips which these malpositions occasion, are frequently considerable.

If any of the temporary molares are present when the bicuspidates perforate in these irregular directions, their removal must be effected. The bar may be applied to bring them outwards, if they have an inward inclination, and pressure made with the finger when the reverse occurs. They ought never to be extracted, unless their position is a source of inconvenience and impediment, as the back situation of the teeth will generally prevent the deformity being observed.

The position of the first and second molares is rarely irregular ; nor does it matter if they are, unless they interfere with the motion of the tongue, &c. But the posterior molaris, or wisdom tooth, frequently advances in a very unfortunate direction. In the upper jaw, it sometimes extends horizontally outwards towards the cheek ; and, in the under, occasionally shoots out from the inner ramus of the jaw, or it may burrow under the large grinder in front of it. If it should unhappily assume the last mentioned position, the most dreadful suffering will inevitably be produced, and will never subside until the opposing tooth is extracted, an operation which cannot be performed too soon. In the two former instances, and in similar ones, when the position of these teeth is a source of inconvenience, they themselves should be removed : though it sometimes will require considerable ingenuity to accomplish this.

#### IRREGULAR POSITION OF THE UNDER JAW.

It has already been mentioned, that a very unseemly deformity is occasioned by the undue prominence of the under jaw, when the under teeth advance in front of the upper. The complete removal of this may be easily effected by the following simple contrivance :—

A model of the inferior incisors and canines is to be taken, on which a thin gold plate is to be accurately struck up. To the surface of this a piece of ivory is to be fitted and attached, the bone being left prominent on the inside, and filed away on the

outer. The plate being fixed to the teeth by means of small silk ligatures, in the ordinary way, the ivory will strike on the inner side of the upper teeth when the jaws approximate; these will thus be brought forward, and the motion of the jaw will receive an inward inclination.

This may also be effected by means of a piece of pewter, modelled to the teeth; but the mode I have suggested is infinitely preferable.

In conclusion I have to observe, that the treatment of all cases of irregularity ought, if possible, to be attempted before the patient exceeds twelve or thirteen years of age. Until this period, the roots of the teeth are not completely formed, and the attachment to their sockets is comparatively so slight, that they may easily be directed into the most favorable position; but, at a later age, they become so firmly fixed, that it is almost impossible to move them by the ligature.

I am aware that this advice of mine is almost diametrically opposed to that of a high authority, Mr. Bell, who recommends the treatment to be postponed until the individual has attained the adult age. In this opinion I cannot concur. It is totally contrary to that of all the best dentists who have written on the subject. It is especially opposed to that of John Hunter; and, in this instance at least, one may safely say,—*Mallet errare cum Platone, quam cum aliis recte dicere.*

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## CHAPTER II.

### OF IMPERFECTIONS OF THE ENAMEL.

*Preternatural Transparency of the Enamel, arising from deficiency of its earthy substance—Chalky appearance of it, arising from Redundancy of this, or want of Gelatin—Denudation of the Enamel—Wearing down of it and the Teeth in Mastication.*

WHEN speaking of the enamel and its chemical composition, it was mentioned in what proportion its elements exist, when it is in a state of perfection. It would seem, however, that, on some occasions, its earthy ingredients are defective in quantity; and, at other times, that they do not enter properly into combination. Variations of this nature give rise to corresponding imperfections in the enamel, and alterations in its appearance.

These peculiar conformations are often found to be hereditary; indeed, there is perhaps no feature in which the different members of a family bear a nearer resemblance to each other, than in the formation of their teeth; and this will often be observed,

not only in their general appearance and arrangement, but also in the diseases and affections to which they are subject.

The gelatinous matter which, in perfect enamel, exists in an almost incredibly small proportion, appears frequently to be present in a larger quantity. On other occasions, the earthy elements preponderate. When there is a superabundance of the gelatin, the teeth have a highly delicate and transparent appearance, which at first is exceedingly beautiful, although the attraction is seldom permanent, for they are generally soon attacked by caries, which, in this instance, invariably goes on with great rapidity.

On the other hand, when there is either a preponderance of the earthy bases, or if they do not enter properly into combination, the particles of the enamel are not united with a sufficient degree of tenacity. When this occurs, the teeth have a disagreeably white and chalky-looking appearance, and always rapidly give way.

There is a third species of imperfect formation of the enamel, consisting of a partial deficiency of it on the anterior surfaces of the teeth, especially of the incisors and canines. When the enamel is thus defective, the edges of the teeth have a broken appearance, and their anterior surfaces appear to be notched, or perforated by small superficial openings.

This imperfection seems to arise from the enamel not having been at first deposited in sufficient quantity on these parts of the teeth, by the vessels which secreted it; although it appears inexplicable how this should occur only on some portion of their surface, while the rest is surrounded with the vitreous substance in a state of perfection.

When the teeth are thus affected, they have generally an unhealthy appearance, but are often exceedingly durable.

Analogous to this imperfection is the disease alluded to by Hunter, under the name of "decay of the teeth by denudation." "The first appearance of it," he observes, "is a want of enamel, whereby the bony part is left exposed; but neither the enamel nor the bony part alter in consistence, as in ordinary decay. As this decay spreads, more and more of the bone becomes exposed; in which respect, also, it differs from the former decay; and hence it may be called a denuding process. The bony substance of the teeth also gives way, and the whole wasted surface has exactly the appearance as if the teeth had been filed with a rounded file, and afterwards had been finely polished. At these places, the bony parts being exposed, become brown."

This disease usually first appears on the centre incisors, and thence extends to the lateral, canines, and small grinders; and sometimes, although more rarely, to the molares. It may either

assume the appearance of a regular and polished groove, extending in a continuous line along the whole of the anterior surfaces of the teeth, or the enamel may be removed in rough and irregular patches; and the whole of it may be thus detached from the anterior surfaces and sides of the teeth.

The cause of this disease is involved in much obscurity. Hunter observes, "From its attacking certain teeth rather than others in the same head, and in a particular part of the teeth, I suspect it to be an original disease in the teeth itself, and not to depend on accident, way of life, constitution, or any particular management of the teeth."

#### WEARING DOWN OF THE TEETH IN MASTICATION.

Connected in some degree with imperfection of the enamel is the occasional total disappearance of it from the edges and crowns of the teeth. This, undoubtedly, to a certain extent, arises from the constant friction of the opposite teeth on each other during mastication, as it is generally observed in sailors, and others who subsist chiefly on hard articles of food, as biscuits, &c. : but it appears still more frequently to proceed from original malformation, which alone will account for the rapidity with which it sometimes goes on.

A very beautiful provision is generally made by nature for the protection of the nerves during the progress of this affection. In proportion as the bodies of the teeth are removed, their vessels and nerves disappear, and the canals are gradually filled up by a transparent osseous substance, which appears to be deposited by the vessels of the internal membrane. It thus happens that when the centres of the teeth are exposed by the advance of the abrasion, no pain is occasioned, as the nervous pulps have been absorbed, and the space they occupied has become solid bone.

Nature, however, does not always provide this bountiful protection. I recently met with the case of an old gentleman, whose teeth had been thus worn down until they became the subjects of serious toothache. The suffering produced by the exposure of the nerves was so acute that I was obliged to remove nine of his teeth, successively, in the course of a month. In the roots of all of them the canals were pervious, and the nerves distinctly visible.

All these affections of the enamel are unfortunately irremediable; although the caries, in which they ultimately terminate, may generally be materially retarded if the teeth are kept clean, and corroding substances prevented coming in contact with them.

## CHAPTER III.

## OF CARIES, OR DECAY OF THE TEETH.

*Its Origin, Prevention, and Treatment.*

CARIES is the disease to which the teeth are most subject, and, indeed, it may be considered as the one in which almost all their other affections terminate.

It is a species of mortification or decomposition of their structure, which commences in that part of the osseous substance which is situated immediately beneath the enamel, and extends until it destroys the whole body of the tooth. On reaching the roots its progress is for a time arrested, although these are ultimately also involved in the decay.

The disease arises from a diminution of the vitality either of the whole, or of some part, of the structure of the teeth, in consequence of previous inflammation.

The first appearance of caries is a small dark colored spot on the enamel, arising from the alteration in the texture and color of the bone beneath. The disease has made considerable progress in the interior before it thus exhibits itself externally, as will be observed if a tooth, extracted in this stage, is cut across; the bone immediately below the enamel will be found to be softened and discolored. But the enamel is as yet unaffected, and merely exhibits, through its transparency, the altered appearance of the structure beneath. The discolored spot gradually increases in size and deepens in hue as the disease extends.

Contrary to that law which holds good in every other part of the body, in which every diseased structure is observed to have a tendency to extend towards the surface, caries of the teeth almost invariably proceeds in an inward direction. The enamel is only latterly affected, and although possessed of but little organization, and no living power to enable it to resist disease, yet from the natural disposition of caries to extend towards the centre of the teeth, and perhaps in some degree from the great density of the enamel itself, and its peculiar crystalline texture, it usually happens that it rarely becomes diseased until a great part of the osseous interior has been destroyed.

When the caries has proceeded to a certain extent in the bone, the enamel, being deprived of its support, at last gives way, and leaves an opening into the interior of the tooth. Often, however, it holds out still longer, until the whole of the osseous substance has been destroyed, when by some trifling accident the tooth is

broken over, and discovered to have been reduced to the condition of a shell, although little or no external decay had previously been observed.

The whole of the body of the tooth being now removed, the farther advance of the disease is for some time retarded, the greater vitality which the roots possess enabling them to hold out longer against its encroachment. They will frequently remain sound in their structure, and firmly attached to their sockets, for many years after the crowns of the teeth have been destroyed. But when in this state, the roots no longer possess the same vitality as before, as the vessels and nerves in the canals have been removed by absorption; and they are to be considered as little better than foreign bodies in the mouth. Nature itself, indeed, seems to indicate this, and makes an effort to expel them. They are generally at last removed, partly by expulsion from their sockets, and partly by the action of the absorbent vessels.

The teeth are subject to caries at all periods of life, no age being exempted from this disease. It is, however, most apt to occur in early years. The temporary teeth are especially liable to it; and the permanent ones are more frequently attacked during the first few years after their formation than at any subsequent period. This undoubtedly, to a certain extent, proceeds from several circumstances at this time leading to the production of the disease; as the pressure of the teeth on each other, from want of room in the maxillary bones, and especially to inattention to cleanliness on the part of the individual. But it also arises in consequence of the nerves and vessels of the teeth being then in a more active and irritable state, and of course more apt to become the subjects of irregular action. This view of the case is confirmed by the observation, that after forty-five or fifty years of age the teeth more rarely become carious, their sources of organization being then considerably impaired, or having altogether disappeared.

All classes of the teeth, and every part of their bodies, are, *cæteris paribus*, equally subject to caries, although the form and position of some of them render them more so than others. Thus the molares, from their greater extent of surface and the inequalities of their crowns, afford more facility for the commencement of the disease than the canines or incisors, and are more frequently observed to become carious, especially in the under jaw.

The upper incisors are also exceedingly apt to become affected, when they are in close contact with each other. The disease, in this instance, is either caused or accelerated by their pressure on each other; as it is almost invariably observed to commence on their sides, where they are in apposition, and usually goes on with great rapidity; although the affected teeth do not contami-

nate the sound ones, as is generally supposed, and even asserted by Mr. Fox. Still less reason is there to believe in the supposition of this gentleman, that an "acrimonious discharge," arising from the carious tooth, acts contagiously on the adjoining sound ones; for it is certain that there is no such secretion. The cause of the decay is simply the pressure; and the disease is usually extensive and rapid, because what produced it in one tooth will occasion it in another.

The incisors of the lower jaw are not so liable to become carious, and the disease rarely commences on their sides, however close they may be in contact. This probably arises from the comparative thickness of their enamel, and the small proportion of the bone in the bodies of these teeth; as, when caries does occur here, it is usually observed to begin on the neck of the tooth, or on the lateral part of the root adjoining it.

The canines, when unaffected by lateral pressure, are least liable of any of the teeth to become carious, and the wisdom teeth are most so.

The teeth are generally observed to decay in pairs. When a tooth on one side of the mouth is carious, its fellow on the opposite will usually be found to be in nearly the same condition. This is a well known occurrence, although it is often a matter of surprise, and the cause of it rarely understood. A moment's reflection will explain the mystery, if we consider that the teeth were originally formed in pairs, that their organization must of course be nearly equal, and that if it has in the instance of one yielded to this disease, the other cannot be in a condition to resist its attack.

Caries leads not only to the premature and total destruction of the teeth, with all the injurious effects upon the speech, appearance, and health in general, incidental on their loss; but is the source of one of the most painful affections to which mankind is subject. When the disease has made an opening into the centre of the tooth, inflammation of the highly delicate lining membrane of its canal generally ensues, and occasions the well known affliction of toothache.

Sometimes, however, no pain results from the exposure of the interior of the teeth, in consequence of the membrane and the enclosed nerves and blood vessels having been removed by the process of absorption, in proportion as the caries extended its ravages. It thus frequently happens, that the whole of the teeth may be destroyed by this disease, without the individual experiencing the slightest pain. This provident protection occasionally afforded by nature, is especially observed in the decay of the temporary teeth, when the delicate frame of the child is less able to endure the pangs of toothache.

## ORIGIN AND CAUSE OF CARIES.

Considerable diversity of opinion exists on the question of the origin of this disease, and different explanations have been given by the three leading authors, to whom I have already alluded.

The theory proposed by Hunter is exceedingly imperfect, as his unfortunate belief in the non-vascularity of the teeth prevented him from giving that correct explanation which he otherwise would have made. He says, "It is such a decay as would appear to deserve the name of mortification; but there is something more, for the simple death of the part would produce but little effect, as we find that teeth are not liable to putrefaction after death; and therefore, I am apt to suspect, that, during life, there is some operation going on, which produces a change in the diseased part."\*

The opinion of Fox is still more unsatisfactory. He seems, indeed, to have been almost aware of the true origin of the disease, although he does not express himself with his usual felicity. He says, "If a sound tooth that has been recently extracted, be broken, the membrane will be found to be firmly attached to the bone of the tooth, forming the inner cavity. But when this membrane becomes inflamed, it separates from the bone, and the death of the tooth is the consequence. That this is the proximate course of caries, appears to be highly probable, by remarking, that a caries of other bones is caused by a separation of those membranes which cover them, and which are attached to them. Thus, a separation of the periosteum will cause a death of the *tibia*; or that of the *pericranium*, a caries of some part of the bones of the head."†

It is not necessary for me to point out the inconsistency of this explanation. It has been already ably done by Mr. Bell, who remarks that, "Exclusive of the circumstance that caries is, in this passage, confounded with necrosis, it contains, in every respect, a false view of the question."‡

The theory which the latter gentleman has proposed, I conceive, approaches nearer to accuracy than either of those of his predecessors, as it is substantiated not only by his own matured observation, but also by his discernment of the rocks on which those who preceded him had foundered. Concurring thus with him in opinion, I shall here insert, in his own words, the improved explanation he has proposed.

"The true proximate cause of dental gangrene (caries,) is inflammation; and the following appears to me to be the manner in

\* Nat. Hist. of the Teeth, p. 135. † Diseases of the Teeth, p. 13.

‡ Bell on the Teeth, p. 123.



which it takes place: When, from cold, or any other cause, a tooth becomes inflamed, the part which suffers most severely is unable, from its possessing comparatively but a small degree of vital power, to recover from the effects of the inflammation; and mortification of that part is the consequence. That the bony structure of the teeth is *liable* to inflammation, appears not only from the identity of the symptoms which take place in them when exposed to causes likely to produce it, with those which are observed in other bones when inflamed; but more conclusively still from the fact already mentioned, that teeth are occasionally found, in which distinct patches, injected with the red particles of blood, have been produced by this cause, after the continuance of severe pain. A tooth which has been the subject of inflammation, will often remain without any diseased appearance for weeks or months afterwards; but at length the consequences which I have described become obvious, by the occurrence of a darkened spot which shows itself through the enamel; and the gradual destruction of the tooth follows, if means be not taken to arrest its progress. I have known a case in which inflammation had taken place through all the molares of one side, both above and below; and notwithstanding it was speedily subdued by leeches, &c. yet within a year afterwards, scarcely any of the teeth so affected had escaped the attacks of gangrene, although the corresponding teeth on the other side remained free from disease.

"The situation in which gangrene invariably makes its first appearance, immediately under the enamel upon the surface of the bone, is, I think, explicable only with the view I have taken of the structure of the teeth and the nature of this disease. As the vessels and nerves which supply the bone of the teeth, are principally derived from the internal membrane, it is natural to conclude, that, in so dense a structure, the organization would be less perfect in those parts which are farthest removed from its source; and that, in the same proportion, they would be less capable of resisting the progress of mortification as we find that those parts of the body that are farthest removed from the source of circulation, are more particularly prone to gangrene, and those diseases which arise from want of activity in the sanguiferous system."

#### OF THE REMOTE OR PREDISPOSING CAUSES OF CARIES.

Although caries of the teeth does not appear to arise from causes which affect the general health, many persons of robust constitutions being observed to be exceedingly prone to this disease, and others, although of a more delicate frame, are almost wholly free from it, yet it is undoubtedly materially influenced by predisposing causes.

The first of these, perhaps, is hereditary predisposition; for it

will generally be remarked, that, if the parents have bad teeth, the mal-formation will, in all probability, be reproduced in their offspring; and it is by no means uncommon to find the teeth of different individuals of a family decaying in exactly the same way, at corresponding periods of life.

Imperfect congenital formation is another of the principal predisposing causes of caries. This may proceed either from the rudimentary pulps having been in an unhealthy condition, or it may arise from the inactivity of the vessels by which the enamel and osseous substance were secreted. Either of these occurrences will impair the organization of the teeth; and, of course, render them more prone to disease.

Another predisposing cause of caries is the irritation produced on the constitution and general health of the child, by all those diseases incidental to infancy, which usually occur at the time that the permanent teeth are in the act of being formed.

Febrile diseases, and all those affections that are attended with long confinement, dyspepsia and sedentary habits, often give rise to caries of the teeth. It has been remarked, that the disease is particularly apt to arise during the confinement attending on parturition.

But of all the injurious agents on the teeth, and predisposing causes to early decay, there is none, I believe, so frequently destructive as mercury. The effect of this medicine on the teeth is usually observed only at a more advanced period of life, when the operation of "the specific" on the mouth is considered as a criterion of its introduction into the system. But I am convinced that it is in earlier years that most mischief is done by mercury, and observe with regret, that the importance of this circumstance has not hitherto been sufficiently noticed by preceding authors. The large and continued doses of calomel which are so indiscriminately given to children, for almost every disease, either by weakening the constitution, prevent the proper formation of the teeth, or, by the powerful stimulus which mercury always exerts upon the absorbent vessels, cause the absorption of their substance as soon as it is deposited. I am convinced that it is solely from this use, or rather abuse, of calomel, that we must trace, not only the origin of that tendency to early and extensive caries, which so frequently terminates in the total and premature destruction of the teeth of youth; but also, that it is from the same source that those deficiencies of the enamel proceed, which are considered as unaccountable, and from which the teeth sustain irreparable injury.

## EXCITING CAUSES OF CARIES.

When there exists any predisposing tendency to caries, the disease will be readily induced by any of those exciting causes which act more immediately on the teeth.

The first of these unquestionably is the neglect of the individual to preserve the teeth in a state of purity. If the tooth-brush is not frequently used, the particles of the food will accumulate on the teeth, and, there undergoing decomposition, not only taint the breath while it passes through the mouth, but act injuriously on the teeth by their corroding influence.

The extensive caries which is so often observed in the teeth of youth, arises almost solely from inattention to cleanliness, although this is rarely confessed, and the disease is almost invariably attributed to the predilection of children for sugar, &c. Now, notwithstanding the antiquity of this popular explanation of premature destruction of the teeth, I do not believe that it has much foundation in reality, nor that any substances which are taken with impunity into the stomach, will act injuriously upon the teeth.

Another exciting cause of caries is the pressure of the teeth on each other. This is especially observed in the front teeth of the upper jaw, where the space for their reception is so small. The teeth are thus generally in close contact at their sides, and by the continued pressure which they exert on each other, the crystalline texture of the enamel is gradually broken down. When the osseous interior is thus exposed, caries commences, and generally goes on with great rapidity; although there is no reason to believe that the affected teeth then act contagiously on the sound, as is popularly supposed, and even asserted by Mr. Fox, who says, "When the caries is communicated by contact, it probably arises from the action of some acrimonious discharge from the decaying tooth, which, in the first place, occasions a decomposition of the enamel, and afterwards the destruction of the tooth. But there is this peculiar difference, that, in the one, the decay proceeds from the interior to the exterior part; whilst, in the other, it commences on the surface, and extends to the cavity." I have already remarked how circuitous and improbable this explanation is, and that it is much more natural to suppose that, as the pressure on the teeth is equal, they will be affected by it in exactly the same way.

Finally, all external injuries, blows, &c. or any inflammatory affection of the teeth, as that induced by exposure to cold, or by the formation of tartar, may be considered as exciting causes of their decay, although the disease may not appear until a considerable time after the inflammation has subsided.

## PREVENTION AND TREATMENT OF CARIES.

It may appear somewhat empirical to talk of the prevention of any disease, and especially of this, a charm or specific against which every charlatan who displays himself in the daily journals, pretends to possess. These have been so invariably proved to be completely delusive, that one may safely predict that the day is not remote when even the most credulous will be no longer duped by such statements. The progress of caries of the teeth may indeed be almost always materially retarded by an efficient practitioner, but the prevention of it is almost exclusively confined to the patient.

Care should be taken to preserve the teeth in a state of purity. For this purpose an ordinary tooth-brush with water will be sufficient, although a little of some impalpable powder, that acts by a gentle friction, may be used with advantage. In warm weather, water at the ordinary temperature may be used; but during winter, or in cold climates, it should be slightly warmed; for it is an object of considerable importance to allow no fluids, nor any substance, to come in contact with the teeth, if their temperature is either so high or so low as to injure these organs by accelerating or diminishing their natural heat.

All exciting agents should be carefully removed. The teeth should be occasionally examined by the dentist, and any tartar removed which may have accumulated, lest the irritation which this foreign body always produces in the gums should be extended to the teeth, from the close connection that subsists between them.

All acids and acidulous fluids should be sedulously avoided, as they not only highly irritate the teeth, but decompose their substance, and especially their enamel. When it is necessary to administer them medicinally, as in some febrile diseases, they should be sipped through a tube, or common quill, to prevent, as much as possible, their coming in contact with the teeth; and the farther precaution ought to be taken of rinsing the mouth with water after using them.

Although all the acids, and substances containing them, are highly injurious to the teeth, yet empirical practitioners do not hesitate to employ these for the purpose of cleaning them; the preternatural whiteness which acids always impart to the teeth before destroying their substance, forming the attraction which cupidity on the one side holds out to vanity on the other. It is scarcely necessary to say, that all such charlatans, with their tooth powders and "dentifrices," that are "guaranteed to produce white teeth," should be sedulously shunned. If, notwithstanding repeated warnings, persons are still found sufficiently credulous to employ them, their destructive effects will soon be discovered;

the teeth, at first rendered unnaturally white, quickly lose their color, and, in general, rapidly decay; or, in the few instances in which their texture is not totally destroyed by such treatment, the patient is perpetually annoyed by their subsequent extreme irritability.

It has been already mentioned, that one of the chief exciting causes of caries is the injury done to the enamel by the pressure of the teeth on each other. This may, in most cases, be prevented by attending to the mouth at the period that the permanent teeth advance; and following that treatment, which, when speaking of irregularities, was recommended for obviating what is termed "crowding of the teeth." When the teeth are thus, from want of room, forced into an irregular position, it is the common practice to extract one or more of them, to afford space to the others—a course which cannot be too severely reprehended, as the whole of their number may almost invariably be retained, and brought into a regular arrangement by the use of the bar and ligatures, in the hands of a dentist of ordinary skill.

In those cases in which the caries has commenced on the sides of the teeth before the practitioner is consulted, it will be requisite for him to remove it by passing a smooth thin file between them; a remedy, however, which should not be resorted to, unless it is imperatively called for by the progress of the disease. The greatest care must afterwards be taken by the patient to keep the space clear, and allow nothing injurious to the teeth to accumulate within it. Considerable benefit may also be derived by the occasional application of a little lint moistened with the camphorated spirit of wine, or some similar anti-septic tincture. When the cavity made by the progress of the disease is larger, and its situation is favorable for the retention of artificial substance, the whole of the carious part should be removed, and gold leaf introduced in its place. The mode of accomplishing this "stopping," or "stuffing," will afterwards be detailed when speaking of the various operations on the teeth.

These are the local remedies for caries; and the nature of the disease seldom admits of any other treatment. Occasionally, however, much benefit may be derived by the application of leeches to the surrounding gum, and afterwards promoting the bleeding by warm fomentation, in those cases where the teeth have been attacked by inflammation, which, if not thus subdued, might terminate in their decay.

Before concluding this chapter, it may be well to say a few words regarding the roots of the teeth which have been destroyed by this disease.

When the fangs are sound, and occasion neither pain nor inconvenience, it is well to leave them as they are; as they afford considerable support to the adjoining teeth, as long as their sockets

remain unabsorbed, and facility for the attachment of artificial teeth if required. But if the disease appear to be going on in them, or if their presence produce any irritation of the gum and sockets, they should invariably be removed. Indeed, the necessity of this practice is indicated by nature herself, as it is observed, that when the bodies of the teeth are gone, the roots are not only gradually removed by absorption, but are at the same time expelled by a deposition of osseous substance in the bottom of their sockets.

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#### CHAPTER IV.

##### OF TOOTHACHE AND ITS TREATMENT.

WHEN, by means of the progress of caries, an opening has been made into the centre of a tooth, and the internal membrane is exposed to the action of the air, saliva, and other irritating agents, inflammation of it ensues. and gives rise to the well known affection of toothache.

In this disease all the usual symptoms of inflammation occur, especially increased vascularity and swelling. The latter characteristic, indeed, is the cause of the violently acute pain which this affection so generally occasions; as the solid and unyielding sides of the canal will not permit of that distention of the membrane which its increased volume would require. The expansion of it is thus wholly directed inwards, and, by the compression of the nerve, gives rise to the exquisite suffering.

There is perhaps no disease, arising from a source apparently so trivial, which occasions suffering so severe as that of toothache. The affection is so often experienced by a great majority, if not the whole, of the human race, that it is unnecessary to give any description of its symptoms: or, indeed, would this be an easy matter, as the form which it assumes, and the sensation which it communicates, vary in different individuals. In some instances the pain is of a dull, gnawing description, and incessant; in others it is periodical in its attacks, and exceedingly acute. In all cases it is aggravated by the approach of any object that is likely to irritate the excited nerve, as a draught of cold water, or of air, exposure to inclement weather, or any similarly exciting agents.

From the sympathy which exists between the teeth and the rest of the body, the pain is rarely confined to the seat of the disease, but is generally extended to the adjoining parts, giving rise to painful swelling of the face, headache, irritation of the ear, &c. Earache, indeed, as I have already mentioned, very often occurs from the excitement of some of the posterior teeth; the wisdom

teeth of the under jaw are most frequently the cause of it, in consequence of the communication which exists between the ear, and the inferior maxillary nerve at the posterior part of the jaw, by means of the chorda tympani. From a knowledge of this circumstance, it will be obvious how requisite it is to make a careful examination of the teeth, when any inflammation arises in the ear; and if a carious tooth is discovered, which, from its situation, is likely to be the cause of the auricular irritation, extraction of it should be performed, and will generally afford relief.

Sometimes the pain is more acute in these adjoining parts, than in the affected tooth itself, or it may be communicated to the adjacent teeth; for it is by no means uncommon to find the toothache attributed to a perfectly sound tooth, while little or no pain is experienced in the diseased one. This frequently occurs in disease of the molares, and especially of the *dentes sapientiæ*; the pain arising from the excitement of one of these teeth being often referred to those adjacent.

#### TREATMENT OF TOOTHACHE.

The treatment of toothache may be either palliative or radical; the former consisting in the application of remedies which may temporarily alleviate the pain, and afterwards allow the cavity to be filled up with gold, to prevent its recurrence: the latter, it is almost needless to observe, is the extraction of the tooth.

The palliative means suggested for the cure of toothache, are innumerable; as the empiric has in no department of the medical profession exerted himself so industriously as in his efforts to discover a remedy, or (what answers the purposes of the charlatan equally well) a pretended one, for this very common affliction. I shall not, however, notice any of these precious nostrums, but leave them entirely to that publicity which their modest and ingenious "inventors" find for them, through the medium of the daily journals.

The remedies occasionally employed with this view, by respectable medical practitioners, are diametrically opposite in their nature and mode of acting; anodyne applications being recommended by some, for the purpose of diminishing the sensibility of the nerve; and pungent or caustic ones by others, with the object of destroying it. Both of these have been applied occasionally with benefit; the first being generally more agreeable to the feelings of the patient, but often uncertain in their effects; while those of the other class, although they usually increase the pain at the moment of application, yet frequently act so powerfully on the nerve, as to ensure its destruction.

Among the anodyne applications, those containing opium, or any of its concentrated preparations, are generally the most bene-

ficial. A little cotton lint, moistened in tincture of opium, or Battley's solution, and applied to the tender tooth, will often alleviate the pain. The tinctures of aconite, belladonna, hyosciamus, &c. have also been frequently used with temporary success.

It has been supposed that the spirit of wine, with which all these preparations are made, (excepting Battley's solution,) is nearly as efficacious as their anodyne bases; as it has often been found to diminish the pain, either when applied in a concentrated state, or when diluted with an equal quantity of water, as in the form of brandy; or again, when, by being combined with an acid, it has undergone that peculiar change by which it is converted into ether.

Medical practitioners, besides recommending anodyne preparations to be locally applied, frequently administer them internally, for the purpose of diminishing the general nervous excitement. A professional friend of mine, a distinguished physician in Dundee, Dr. Nimmo, who, like the majority of medical practitioners, is averse to performing the operation of extraction, usually prescribes:

|                     |              |
|---------------------|--------------|
| R Mistur. Camphor.  | 3 vi.        |
| Tinct. Opii,        | Gtta. xxxvi. |
| Vin. Tart. Antimon. | Gtta. xvi.   |

The same gentleman has informed me that the tinct. saponis cum opio, made warm, and applied externally to the jaw, will be found exceedingly useful.

The pungent applications that are used consist chiefly of the stronger essential oils. A drop of the essential oil of cinnamon, or of cloves, introduced into the cavity of the tooth, is said frequently to alleviate the pain. Camphor has also been mentioned as occasionally useful.

Of the caustic applications, the nitrate of silver is the best, and I believe was much recommended by the celebrated Abernethy. It may be applied either by introducing a small piece of it into the cavity of the tooth, or, in the state of a strong solution, with a hair pencil. In either case it is necessary to cover the carious opening with a little cotton, to prevent the diffusion of the caustic, and the injurious effects of it on the tongue and adjoining parts, if it were allowed to come in contact with them.

The stronger acids, especially the nitric, have also been recommended for this purpose: but the practice appears reprehensible, as they will seldom be found beneficial, and they invariably destroy the substance of the tooth.

The actual cautery, as a remedy for toothache, (the only affection for which I believe it is now retained,) is rapidly falling into



disuse, not only from its formidable appearance, which is generally far more alarming to the patient than the extraction of the tooth, but also from the uncertainty attending its application; as, from the smallness of the canals of the teeth, and, in the molares, in consequence of the diverging of the roots, it can rarely, or rather never, be applied so effectually as to destroy the nerve.

The absurd and cruel practice of applying blisters to the cheeks, &c., for relieving the pain of toothache, is still more reprehensible, and is only noticed here for the purpose of stating that it should never be followed.

Great benefit will frequently be derived from the application of leeches to the gum surrounding the excited tooth, and afterwards promoting the bleeding by fomentation. This local bleeding is especially beneficial, when resorted to in the early stage of the disease.

These are the principal palliative remedies for alleviating the painful symptoms of toothache, although they are at best always uncertain in their results, and often totally fail. But should they in any instance be successful in removing the pain, no time should be lost in permanently filling up the cavity with gold leaf, to prevent its recurrence. The mode of doing this, and the precautions requisite to ensure a successful result, will be explained when detailing the operations on the teeth.

The radical cure for toothache, extraction of the excited tooth, is, however, undoubtedly the surest. The pain of the operation, when scientifically performed, is often far less severe than that of the disease, or the application of these alleviating means, and the result of it is invariably decided. The mode of performing extraction will afterwards be mentioned.

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## CHAPTER V.

### *Of Exostosis of the Teeth, or Swelling of the Roots—Of Necrosis, or Total Death of the Tooth—Of External Injuries of the Teeth—Fractures and Dislocations.*

Exostosis of the teeth consists of a preternatural and diseased increase of the substance of their roots, arising from some peculiar action of the dental periosteum.

The disease apparently derives its origin from some inflammatory affection of this membrane, and is rarely observed in teeth that had been sound before its appearance. In almost every instance it will be found that they have previously either been attacked by caries, or undergone some degree of inflammation.

The seat of exostosis is entirely confined to the roots, which

often extensively affected by it, while the bodies of the teeth appear healthy and sound.

The newly deposited osseous substance differs considerably in appearance from that of the natural bone of the teeth. It is of a lighter and more transparent color, and is irregularly deposited around the roots. By these characteristics the disease will be easily recognized, when the teeth that have been affected by it are removed from their sockets; but before their extraction it is always extremely difficult to discover it.

The pain which exostosis occasions is of a dull, deep-seated nature, and frequently incessant. This sensation is generally communicated to a number, or perhaps the whole of the teeth, as the disease is rarely confined to one of them, but several are generally affected at the same time. From this circumstance, and the healthy appearance which the bodies of the teeth usually present while their roots are thus affected, the pain has not unfrequently been supposed to proceed from *tic douloureux*.

On other occasions, however, absorption of the interior of the sockets takes place, in proportion as the deposition proceeds on the roots; and space being thus afforded for their enlargement, no painful symptoms will be experienced.

#### TREATMENT OF EXOSTOSIS.

In the first stage of the disease, recourse should be had to local bleeding, for the purpose of subduing the inflammation in the membrane; but after the osseous matter has been deposited, and given rise to the more painful symptoms, no permanent relief can be afforded by any other means than the extraction of the tooth; a measure to which both the patient and practitioner are equally averse, as, from the disease being confined to the fangs, and not affecting the external appearance of the teeth, it is rarely discovered until they are removed, and it is difficult to determine which of them are to be extracted; unless, indeed, the practitioner is assisted in his prognosis by the sudden pain which the patient feels when the affected teeth are unexpectedly touched by some hard substance during mastication, or when smartly struck with the handle of any small instrument—a mode of indication which it may be well to keep in view.

#### NECROSIS, OR TOTAL DEATH OF THE TEETH.

Necrosis is another disease of the teeth incidental on inflammation, terminating in the total destruction of their vitality.

The inflammation which gives rise to this disease, is always of a severe description, and may be excited either by long continued irritation, as from the effect of a course of mercury upon the dental membranes, or it may be the result of injury of the teeth

by external violence, when it has been sufficiently great either to break or dislocate them, or to rupture the vessels and nerves as they enter the canals.

When a tooth is thus deprived of its vitality, it shortly afterwards loses its natural color, and becomes of a darker hue. In this condition it will frequently remain for a number of years without producing any annoyance; but, in most instances, it has a tendency to separate from its socket, which is increased by the formation between them of a hard and dark colored body resembling tartar, which tenaciously adheres to the fang. The root also presents a diseased appearance, and irregular, or partially excavated surface.

The irritation excited by the presence of the dead tooth—now a foreign body in the mouth—produces sponginess and ulceration in the surrounding gum, and very frequently gives rise to disease and suppuration in the socket. The purulent matter which is discharged is generally extremely offensive, and will for a long time continue to issue from the neck of the tooth, or by one or more small openings through the socket.

All the teeth are liable to become the subjects of necrosis, but the upper incisors and canines are most frequently affected.

#### TREATMENT.

In the treatment of this disease, unfortunately but little can be done, as, at the time that it is observed externally, the vitality of the teeth has been completely destroyed. If there exists any inflammation of the dental membrane arising from the effects of mercury, the medicine must be discontinued, and local bleeding, either by scarification or by leeching, resorted to, for the purpose of preventing the irritation extending to such a height as to lead to the separation of the periosteum from the tooth. But if this communication has once been destroyed, no subsequent efforts will ever re-establish it, nor any treatment, excepting the extraction of the tooth, be beneficial. The practice of applying astringent injections between the tooth and its socket, although recommended by some writers, I have never found beneficial, and consider it little better than waste of time and prolongation of inconvenience to the patient. They never will succeed in permanently stopping the discharge unless the cause of the excitement is removed.

But if the necrosed tooth be firm in its socket, and occasion no suppuration, extraction of it will be unnecessary, as it will often remain in this condition for many years, without any farther annoyance to the individual than the loss of its color.

## FRACTURES AND DISLOCATIONS OF THE TEETH.

It has been mentioned that external violence was one of the causes of necrosis of the teeth; and as fractures and dislocations of them almost always terminate in that disease, it may be well to notice them here.

Fractures of the teeth are usually occasioned by an accidental fall, blow, or any hard substance unexpectedly coming in contact with them during mastication, as shot in game, stones in bread, &c. Slight fractures, or rather chippings of the teeth, are also very often occasioned by the common but injurious practice of using them for dividing threads.

If the fracture is not extensive, it will only be necessary to file down the sharp edge to prevent its injuring the tongue. The tooth will often remain in this condition for many years without losing its color, or showing any tendency to become carious.

But if so large a portion of the tooth is broken off as to expose the canal and the nerves, or if the fracture assume the appearance of a splinter, extending in a perpendicular direction along the course of the root, the inevitable result will be the complete death of the tooth; and it then becomes a matter for consideration whether the remaining part of the tooth is to be extracted or filed down, so as to allow of another tooth being pivoted upon the root. If the tooth be splintered in the peculiar way I have mentioned, it should invariably be removed, for the sides of the fracture will never re-unite. In the other instance, if the patient is young, it is better also to extract the root, as the adjoining teeth will gradually approximate and fill up the vacancy. At a more advanced period of life, and if the accident has occurred in any of the six front teeth of the upper jaw, the pivoting operation may be performed with advantage.

## DISLOCATION OF THE TEETH.

It frequently happens that the teeth, instead of being broken by the violence of the blow, are entirely turned out of their sockets, or driven into the substance of the maxillary bones. In either case, although they may again become firm, if placed in their former position, they rarely, or rather never, recover their vitality. In the former instance, however, an attempt should always be made to restore them, if too much time have not elapsed after the accident. The socket is to be syringed with warm water, to remove any coagulated blood; and the tooth, after being carefully cleared of all extraneous matter, should be replaced as nearly as possible in its former position, and retained there by a ligature attached to the adjoining teeth, until it adheres, which it frequently will in an incredibly short period.

When the teeth have been forced into the substance of the bone, it is better to extract them at once, than to endanger the risk of the exfoliation, which may occur if they are allowed to remain, or an ineffectual attempt made at replacement.

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## CHAPTER VI.

### OF TARTAR ON THE TEETH.

THE name of tartar has been applied to a calculus substance which is deposited from the saliva, and adheres to the surfaces of the teeth. It forms the most common of all their affections; being observed, in a greater or less degree, in the teeth of almost every individual, and is one of the most frequent sources of irritation of the mouth.

Different explanations have been given of the origin of tartar; some persons believing that it is deposited from numerous minute glands, which they imagine to be situated in the gums, although no trace of these can be observed; and others, among whom is the eminent Delabarre of Paris, supposing that it is secreted by the mucous follicles of the mouth. Both of these opinions are undoubtedly erroneous, as the saliva is the only source of this secretion.

Many circumstances tend to confirm this generally received opinion, but no other need be mentioned than the following: All the earthy salts of which tartar consists, are found to exist in the saliva itself. The deposit is always observed in greatest quantity on those teeth which, from their situation, are most exposed to the action of that fluid, as on the inside of the inferior incisors, where the ducts of the sublingual gland open, and on the outer side of the upper molares, in the immediate vicinity of the duct of the parotid; and tartar has also been frequently found in these ducts themselves, especially in the sublingual, where it has sometimes accumulated in so large a quantity, as, in several instances, to have given rise to ranula.

On being deposited from the saliva, the particles of the tartar unite with the mucus of the mouth, and form a yellow colored crumbling substance, which, settling upon the teeth, adheres to those parts of them that are least exposed to the friction of the tongue, &c. It will thus generally be observed to exist in the spaces between the sides of the teeth, and especially in the under jaw, on which, from the principle of gravitation, it naturally has the greatest tendency to collect.

If the tartar thus deposited is allowed to remain, it rapidly becomes much harder, and adheres with increased tenacity. It also changes in color, becoming of a darker brown hue, and some-

times nearly black ; the particles of it, when soft, readily receiving a tinge from many articles of luxury in ordinary use, as port wine, tobacco, &c.

The matter that has been deposited, forms a nucleus for future increase ; and it often thus collects in such quantities, as to form a body much larger than the teeth which it surrounds. Indeed, several of these are sometimes found to be enveloped in one mass of tartar.

A tendency to this deposition from the saliva, it has already been observed, is exhibited in almost every one ; but it appears to be materially increased by some constitutional affections. Tartar is always found to collect in an unusual degree, on the teeth of persons who are of a sedentary disposition ; or of those who are subject to indigestion. It also generally accumulates during fevers, or any long continued state of inactivity, especially parturient confinement.

It is materially influenced by the habits of the individual, being generally found in largest quantities on the teeth of those who are accustomed to stimulate their salivary glands by the use of such noxious substances as tobacco, &c. ; and in persons who have undergone a mercurial course.

#### EFFECTS OF TARTAR.

The injurious effects of tartar are first visible on the gums, which, by the irritation constantly kept up by the presence of the calcareous foreign body, fall into a state of sponginess, tumescence, and chronic inflammation. They become much increased in size, and of a deep red color, arising from the large quantity of blood in their vessels, and the prevention of its free circulation. They are thus extremely apt to bleed ; and the hæmorrhage, on a very slight incision, will often be profuse. Ulceration of them also frequently arises from this cause.

The irritation is quickly extended from the gums to the alveolar processes, and, by the undue stimulus which it communicates to the absorbent vessels, leads to the rapid absorption of their substance, and the premature loss of the teeth.

A disagreeable taint is always communicated to the breath, by the presence of tartar on the teeth. This offensive affection, indeed, very often proceeds from this cause, although it is generally attributed to a deranged state of the digestive organs.

Tartar is, by most authors, considered to be one of the chief causes of caries. In this opinion, I am scarcely disposed to concur, as the deposition is generally most frequently found on teeth that are perfectly sound, and rarely become carious ; as in the instance of the lower incisors. But there is a peculiar species of tartar, of a greenish colour, which is very apt, from want of

cleanliness, to be formed on the teeth of youth, especially on the anterior surfaces of the superior incisors and canines, that appears to be highly corrosive of the enamel, and in every instance rapidly leads to the destruction of the teeth, unless it is removed.

#### TREATMENT.

The only treatment that will be beneficial for the prevention of these injurious effects of tartar, or retarding their progress when they have commenced, is the entire removal of the source of the irritation. The mode in which this operation (known by the name of "scaling" the teeth) is performed, will be afterwards explained. In the meantime, it may be observed, that much may be done towards preventing the accumulation of the secretion, by the use of the tooth brush, &c.; although the most careful attention on the part of the individual will not prevent the formation of this deposit, which, in many instances, collects so rapidly as to require to be removed by means of instruments, generally at the end of every twelve months, and frequently several times in the course of a year.

The early removal of it is always productive of the greatest benefit, and it is never too late to make the attempt; as the teeth, even although considerably undermined by it, will generally again become firm, and the gums assume a healthy appearance, as soon as the source of the irritation is removed.

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### CHAPTER VII.

#### DISEASES OF THE GUMS AND SOCKETS.

*Of Sponginess, or Chronic Inflammation of the Gums—of Abscess in the Gum, or Gum Boil—of Tumors of the Gums—Treatment of these various Affections—of Absorption of the Sockets, and Loosening of the Teeth—Injurious effects of Mercury on the Gums, Teeth, and Sockets.*

THE first disease of the gums which I shall notice is the very common one known by the name of sponginess. This affection was, by the older authors, termed "scurvy in the gums,"—a name applied on very erroneous grounds, as, in general, it has not the most distant connection with that constitutional disease, and is, in a great majority of cases, observed in those who have not the slightest scorbutical taint. It is true that, in those whose constitutions are affected by scurvy, the symptoms of the disease are generally first observed by the effects of it on the gums: but the appearance which they then present is very different from that of ordinary sponginess.

Sponginess of the gums arises from inflammation, by the ordinary symptoms of which,—increased sensibility, redness, swelling, and determination of blood to the surface,—it is characterized. The inflammation is generally induced by the presence of tartar, by cold, or some similar irritating cause, and is seldom observed until it has assumed the chronic stage.

From the large quantity of blood that enters their vessels, and the inactive condition of them being unable to effect its return, they become surcharged with the fluid, and often bleed profusely, from the slightest cause. They also, from this increased vascularity, become much enlarged, and either separate from the teeth, or but loosely surround them,—presenting an irregular, and frequently ulcerated appearance. The irritation is rapidly extended to the alveolar processes, and the absorbent vessels being stimulated by it, the sockets are destroyed, and the teeth become loose, and drop out.

The sensibility of the gums is generally greatly increased during this affection; but, in some cases, they often appear to be in a state of high irritation, without causing much pain to the individual.

#### TREATMENT.

The treatment consists, first, in removing any source of irritation that may be discovered. If there is tartar on the teeth, it must be removed by scaling instruments.

Much benefit will be derived from local bleeding, which may be easily induced by the tooth-brush, or by a slight incision of the lancet. The incision may either be made, horizontally, across the fangs of the teeth, or, in a perpendicular direction, between them. The latter mode is the preferable one, as the blood vessels are thus more effectually divided, and the enlargement of the gums is diminished by the contraction that follows the re-union of the wound.

The mouth should be frequently rinsed with some slightly stimulating astringent lotion. The common infusion of roses answers very well; but the tinctures of myrrh, of bark, or of camphor, in the proportion of one or two small spoonfuls to a glass of water, are perhaps better.

In those cases in which the gums have become affected in consequence of scorbutical affection, the constitutional treatment requisite for that disease must be followed, before they can be brought into a healthy condition.

#### OF ABSCESS IN THE GUM, OR "GUM BOILS."

These are induced by a more active state of local inflammation, terminating in its ordinary result, suppuration. They generally



arise from the irritation caused by a carious root, or a small loose splinter of the alveolar processes, occasioned by the careless extraction of a tooth. When thus produced, they are generally small, and often remain for years, healing and recurring, alternately, until the source of the irritation is removed.

They are frequently incidental on exposure to cold; and on some occasions seem to arise spontaneously, without any apparent cause. In these instances they are often very large, and productive of much suffering both local and constitutional. When neglected, they sometimes become extremely formidable, involving other parts of the mouth and face in the inflammation; and if this is not subdued before it terminates in suppuration, the matter is apt to force for itself an opening through the cheek, which is always difficult to heal, and often leaves an indelible scar.

I recently witnessed the case of a young lady who had experienced the most dreadful suffering, accompanied with frightful swelling of the face, from a large gum boil, produced by the irritation of an advancing wisdom tooth. The medical attendant had unfortunately neglected to ascertain the cause of the disease, until the matter forced its way through the cheek, and left a fistulous opening which weeks will not close.

#### TREATMENT.

The inflammation should be subdued, if possible, in its early stage, by the application of leeches; but if it cannot be prevented proceeding to suppuration, this termination of it ought to be accelerated by applying warm fomentations to the cheek.

As soon as the dull throbbing pain indicates that matter has been formed, an incision should be made into the tumor, for its evacuation. This is infinitely more effective than the common practice of puncturing, by which facility is afforded for the formation of fresh matter; although even this treatment will sometimes require to be several times repeated, and it may be necessary to touch the interior of the abscess with a slight solution of lunar caustic, to induce a more healthy action in the vessels, before the suppuration will cease.

#### OF TUMORS GROWING FROM THE GUMS.

Tumors frequently grow from the gums, and cause much annoyance by their size and irritability. They appear at first to be merely an enlargement or thickening of the membrane, usually produced by the irritation of a carious root; but they ultimately generally assume the form of a large rounded tumor, which is attached by one extremity to the gum by a narrow cervix, while the body of it remains loose in the mouth.

These excrescences are most frequently found growing from

the inner side of the under jaw, near its posterior extremity; and, by impeding the movements of the tongue, and their constant exposure to injury from the teeth, occasion so much inconvenience, that the individual is generally desirous for their removal.

This is most easily effected by means of a ligature, which may either be a single one, enclosing the neck of the tumor in a noose, or used as a double ligature, by passing two threads with a needle through the middle of the cervix, and tying one of them on each side. By either of these means, the circulation of the tumor will be stopped, and its body will generally drop off in the course of a few days.

This mode of destroying them is preferable to the use of the knife or the scissors, as these tumors are often exceedingly vascular, and, if they are removed by an incision, the hæmorrhage is generally severe, and difficult to arrest.

After the excrescences have been detached, it will be beneficial to touch the gum either with the lunar caustic, or a strong solution of it. This materially contributes to restore a healthy action to the vessels, and prevent the recurrence of the tumors, a tendency to which they frequently exhibit.

#### ABSORPTION OF THE SOCKETS, AND LOOSENING OF THE TEETH.

The absorption of the alveolar processes, and loosening of the teeth, is one of the natural consequences of the advances of age. It is not, however, always a criterion of this, as there are many instances of individuals having lost their teeth in this manner, who have not attained the meridian of life; and on the other hand, it is by no means uncommon to observe persons far advanced in years, whose teeth are firm, and their sockets in a state of preservation.

Premature absorption of the alveolar processes almost always arises from the undue stimulus which is given to the absorbent vessels, by such irritating agents as, the presence of tartar on the teeth, the effects of mercury, exposure to cold, &c. The teeth are also frequently expelled from their places by a singular process of deposition of osseous matter in the bottom of their sockets.— This generally occurs at the same time that the sides of these are in the act of being removed by absorption, and gives rise to that lengthened appearance of the teeth which is so often observed. The whole of these are frequently thus affected; in other instances only particular teeth become long. The latter circumstance is most apt to occur when the antagonist of the tooth in the opposite jaw has been lost.

It frequently happens that the new osseous matter, instead of being deposited in the bottom of the sockets, is found on their

sides, between them and the teeth. When this occurs, the teeth generally acquire a very irregular position, and are often widely separated from each other.

When the teeth have been removed by absorption, a great alteration is produced on the appearance of the face. The countenance seems shortened to the extent of nearly two inches. When the jaws approximate, the under one advances in front of the upper, and the chin thus appears to be parallel with the extremity of the nose, or occasionally to project beyond it. The lips fall in. The cheeks, deprived of their support below, appear prominent above, and sunk beneath; and we now observe the contracted visage, and all the striking features of age.

#### TREATMENT.

The treatment consists in the careful removal of any irritating cause. If tartar is present, the teeth should be effectually scaled, and the recurrence of it prevented as far as possible by the use of the tooth-brush, &c. If the irritation has been induced by the effects of mercury, the medicine should be discontinued, and some vegetable astringent lotion substituted. The teeth will thus soon again become firm, and the gums assume a healthy appearance.

It has been already mentioned, that when the teeth have become loose in consequence of external injury, as from blows, &c. they should be attached by a ligature to the adjoining uninjured ones, until they become firm. The same treatment may also with much advantage be followed, when the greater part, or the whole of the teeth, have become loose from absorption, or any of the other causes already enumerated. A silk ligature is to be placed around the most posterior tooth of one side of the mouth, and tied by a double knot on its anterior side, immediately beneath the gum. In this manner it is to be extended to the adjoining one, until the whole of the teeth are thus fastened to each other. The ligature thus applied will frequently remain for months, and retain the teeth in a state of comparative firmness. The practice is always highly conducive to the comfort of the patient, and will not occasion the slightest inconvenience, if performed with ordinary dexterity.

Empirical practitioners are constantly boasting in their advertisements of having discovered new and more effectual methods of fastening loose teeth. These assertions, like all those that proceed from the same quarter, will be found to be wholly delusive. There is no other mode of treatment than that which I have detailed; and the practice, instead of being a modern one, is at least as old as the era of John Hunter.

## EFFECTS OF MERCURY UPON THE TEETH, &amp;c.

Having so frequently alluded to the injurious consequences attending the use of mercury, it may be well to mention here its mischievous action on the teeth, gums, and mouth in general; on all of which the most destructive effects have been produced by the abuse of this powerful medicine.

In early life, the large and repeated doses of calomel that are so frequently administered to children, at the time that the formation of the permanent teeth is going on, either, by weakening the constitutional powers, prevent these from being properly developed; or, by stimulating the absorbent vessels, cause them to remove the enamel and the osseous substance, as soon as they are secreted by the arteries. It is thus that the teeth, on perforating the gums, are either observed to be evidently defective, or, if the injury be not externally apparent, their organization is yet so imperfect, that they begin to decay almost immediately afterwards. On other occasions, it may happen that no injurious consequences will be seen, until several years have elapsed, as the creative power, by which the teeth were formed, had been sufficiently energetic to develop them well, notwithstanding the weakening effects of the "specific." But the event is ultimately as certain; the teeth will eventually yield to a premature and rapid decay, unretarded by all the efforts of the individual to prevent it; and generally much to his surprise, as the source from which the malady sprung has been either overlooked or forgotten.

When mercury is administered at a more advanced period of life, and its exhibition "kept up" until the action of the medicine on the mouth affords a criterion of its introduction into the system, the mischief which it does is more strikingly seen. The absorption of the sockets goes on so rapidly, that the teeth are soon exposed to the extent of perhaps one half of their roots, and are rendered proportionally loose. Their periosteum becomes inflamed, and is liable to separate from the roots. The gums are detached from the teeth, and acquire a preternaturally red, swollen, and ulcerated appearance. They become highly charged with blood, and liable to profuse hæmorrhage from the slightest touch. The irritation is communicated to other parts of the mouth. The tongue is greatly increased in size, the interior of the cheeks and fauces are involved in the inflammation, which finally extends to the maxillary bones, and either induces mortification of them, or a tendency to this disease.

Formerly, when it was customary to administer mercury to such excess, as, in the hospital verbiage of that period, to make the unfortunate patients "spit their pint a-day," the total destruc-

tion of the teeth and sockets, and dreadful exfoliations of the maxillary bones, were ordinary occurrences. Happily the practice of violent and rapid salivation is now no longer countenanced, and if mercury is exhibited at all, the constitution is gradually brought under its influence; and the medicine being discontinued whenever a slight affection of the gums indicates that it has acted on the system, no injurious consequences will follow; but the patient, by means of a nourishing diet, and the use of astringent gargles, will soon recover, and the mouth again acquire a healthy appearance.

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## CHAPTER VIII.

### DISEASES OF THE MAXILLARY BONES.

*Diseases of the Maxillary Antrum—Abscess in it, arising from the closure of its Nasal Opening—Tumors in it, attached to Carious Roots—Imperfections of the Palate.*

THE greater number of the diseases of the maxillary bones belong rather to the province of the surgeon than that of the dentist. Extensive exfoliations of the bone, caries, necrosis, &c. are strictly surgical cases; but affections of the antrum, and especially deficiencies of the palate, frequently fall under the notice of the dentist.

The antrum maxillare is the largest of that series of cavities which exist in the bones of the face and head. The use of these is hitherto unknown; some anatomists believing that, by affording extension to the branches of the olfactory nerves, they increase the power of the organ of smelling; and others, that they assist in modulating the tones of the voice. All of these cavities communicate with each other, either directly, or through the medium of the nostrils, into which small ducts from each of them extend. They are lined by a continuation of the pituitary membrane, which passes through the small foramina, and is extended on the parietes of the different sinus.

The Schneiderian membrane, and the continuation of it, which lines these cavities, are especially subject to that inflammation, to which all those of the mucous order are so liable. The maxillary sinus, from its situation, is more frequently affected than any of the others, and inflammation in it is more apt to affect the teeth and other parts of the face.

The most common affection of the antrum is the formation of

matter within its cavity. This is usually merely coagulated mucus, and not of a purulent description, as is generally supposed: for what now constitutes the abscess, was originally the ordinary discharge from the surface of the membrane; the exit of which through the natural channel of the nostrils being prevented, in consequence of the inter-communicating opening being closed by the inflammation, the secretion had thus accumulated within the cavity, until it acquired a purulent appearance.

The lining membrane of the antrum is generally slightly affected, and the nasal opening of the cavity partially closed, on irritation of the nostrils from a common cold. The secretion is then accumulated within the cavity, and occasions a sensation of dull, deep-seated uneasiness, which must be familiar to every one, and usually subsides in a few days, on the re-opening of the channel, when the mucus again flows freely from the nostrils.

But if the inflammation has been severe, and continued so long as to lead to the complete closure of the foramen; or, what is perhaps more frequently the cause of this becoming impervious, if the membrane has, from some innate tendency to disease, gradually thickened, until the opening has been obliterated, the symptoms and the suffering will rapidly increase. The dull oppressive pain is now accompanied by a throbbing sensation, or by acute paroxysms, extending along the face and forehead, in the direction of the frontal sinus. The teeth situated immediately underneath the cavity become exceedingly sensitive. The adjoining parts sympathize. The inflammation is extended to the face, giving rise to painful swelling of the cheek, which frequently increases to such an extent, as to lead to the complete closure of the eye, and produce a frightful deformity.

This enlargement is occasioned, not only by the inflammation of these parts, but frequently also by the expansion of the osseous sides of the antrum, which have yielded to the pressure of the matter within. These sometimes in this stage become carious and exfoliate, or are absorbed and give way. The matter is then discharged by an opening, either externally, through the cheek, or more frequently into the mouth, above the roots of the grinding teeth.

Inflammation of the antrum is also often occasioned by the irritation of diseased teeth. Those which are situated under the cavity, will, of course, most frequently produce it; although sometimes it may arise from caries of a canine tooth, or of the small grinder adjoining to it. It will often altogether subside on the extraction of the carious tooth, and a considerable quantity of highly offensive matter, of a flocculent appearance, will frequently, at the same time, be discharged through the socket. In other

cases, the diseased action in the membrane will still continue, especially in those persons who are of a strumous constitution; the opening that has been made either remaining fistulous, or it may close up, and the nasal foramen again become pervious, and the matter may continue, for many years, to be discharged through either of the channels.

#### TREATMENT.

In the early stages of the inflammation, leeches should be applied for its reduction; and, if the symptoms are severe, the patient may be placed on the anti-phlogistic regimen. The mouth should be examined, and if any carious teeth or roots are found, which, from their situation, are likely to be a source of irritation, they should be immediately extracted. If, notwithstanding these measures, the opening into the nostrils still remains impervious, and the increase of the secretion assumes a formidable appearance, an opening must be made for its discharge.

This is readily made through the sockets of any of the teeth which are situated below the antrum. If any of the posterior teeth is in a carious state, it will, of course, be selected for removal. But in instances where the whole of them are sound, the posterior bicuspidatus is the one best adapted for the purpose, as it is invariably situated under the most depending part of the cavity, and its situation in the mouth readily admits of the application of a straight three-sided trochar, with which the perforation is to be made.

On the extraction of the tooth, the trochar is to be introduced into the socket, and advanced by a rotary motion, until the floor of the antrum is perforated; when the evacuation of the matter will immediately follow. Care must be taken that the instrument, on entering the cavity, is not suddenly carried to its opposite extremity, and the orbit thus endangered by the awkwardness of the operator, or the restlessness of the patient.\*

When the matter is evacuated, the cavity should be syringed with tepid water, to which a little port wine may be added. Frequently the operation will require to be several times repeated, in consequence of the accumulation of the secretion recurring.

\* Mr. Liston, one of the highest authorities on operations of which this country can boast, I believe, recommends that the opening should be made directly into the cavity, through the alveolar process, immediately above the roots of the teeth. Either mode will answer equally well; but the one mentioned in the text, is in general preferable, as the teeth are usually in such a carious condition, that they require to be removed; and their fangs frequently project into this cavity, and will thus, on their extraction, sometimes leave a natural opening for the discharge of the secretion.

In these instances, an injection of solution of sulphate of zinc, or the sulphate of copper in rose water, in the proportion of three grains of the former, or two of the latter to one ounce of water, may be used for promoting a more healthy tone in the secreting vessels. The surface of the membrane frequently becomes so callous, that the strength of the injection requires to be greatly increased, or undiluted port wine may be used with advantage.

#### TUMORS IN THE ANTRUM ATTACHED TO THE ROOTS OF THE TEETH.

Tumors are sometimes formed within this cavity, and give rise to much uneasiness. They are most commonly attached to the roots of any of the teeth that extend into the antrum, and have the appearance of a membranous sac, filled with purulent matter. This sac seems to be a production or elongation of the membrane which surrounds the roots of the teeth; to which it in most cases firmly adheres, but usually remains loose within the cavity.

These tumors or abscesses appear to be produced by the irritation of carious roots; on the extraction of which, they are generally found adhering to their extremities. The capsule which encloses the matter, admits of great elongation, as it is by no means unfrequent to remove in this way a tumor containing a large quantity of pus, through the small opening by which the fang of the tooth had extended into the antrum.

The tumors of a cancerous or fungus hæmatodes nature, to which this cavity is subject, are strictly surgical cases, and are unfortunately almost always incurable; as they, in most instances, re-appear after extirpation. They invariably give rise to great deformity, and agonizing suffering, to which little or no relief can be given, and ultimately terminate in the anticipated death of the exhausted sufferer.

#### IMPERFECTIONS OF THE PALATE.

Deficiencies of the palate are sometimes the result of partial caries of the maxillary and palatal bones in the adult, but more frequently they exist from the period of birth. In the former instance, the imperfection is usually a circumscribed opening in the roof of the mouth, and is, in most cases, confined to the palatal processes of the maxillary bones; but when the case is congenital, an extensive fissure will generally be found extending along the whole course of the soft as well as the osseous palate, from the uvula to the upper lip, both of which are frequently in the same way affected, thus also producing cleft uvula and hare lip.

The annoyance occasioned by the smallest deficiency of the



palate is exceedingly great. The serious imperfection of the speech, the difficulty in articulating, the frequent passage of the food from the cavity of the mouth to that of the nostrils, are sources of constant affliction. In early life it deprives the child of its proper nutrition, as the preternatural communication between the mouth and nostrils prevents the formation of that perfect vacuum which is requisite for the due performance of sucking, and the child must be supported by external aliment, which is ill adapted for the delicate state of the digestive organs at this period.

#### TREATMENT.

(Congenital Imperfection.) If the fissure is narrow, an attempt may be made to unite its sides at a very early period, and will often be attended with success. All that is necessary, is merely to scarify the edges of the opening, and apply a little of the sulphate of copper, or of nitrate of silver, for the purpose of inducing a slight inflammation. Granulations being thus produced, the sides of the opening approximate, and whenever they meet at the smallest points, union of the whole will rapidly follow.

But when the imperfection is extensive, and accompanied with hare lip, a more serious operation will be required. It then becomes necessary to bring the sides of the fissure together by means of ligatures; and it will in general be requisite to postpone the treatment for several years, until the patient has acquired sufficient fortitude to enable him to submit to the operation with that steadiness on which the success of it so much depends. The operation for the cure of hare lip may be performed a considerable time before that on the palate is attempted, as it not only facilitates the operations, to perform them separately, but the contraction produced by the cicatrix of the lip may serve to bring the sides of the palatal fissure nearer to each other, or at least prevent their farther separation.

In deficiencies of the palate arising from caries of the bones, or in congenital imperfection, when the opening is very extensive, no benefit will be derived from any surgical operation; and it will be necessary to have recourse to another mode of supplying the loss of substance. With this view, what are called artificial palates have been devised.

These may be formed either of gold or of bone; the former, however, is generally preferable. Silver should never be used for this purpose, as it invariably undergoes oxydation in the mouth, and frequently proves injurious from this cause.

It is impossible to give any general directions for the construction of these palates, which could be followed with advantage in

any individual case. The form of the mouth, and the different peculiarities of it, are subject to such incessant variety, that the mode of treatment which would be favorable in one instance, might be highly inapplicable in another. It may, however, be mentioned, that, both in constructing and applying them, the practitioner ought to keep in view the prospect of a natural cure, or at all events, of a diminution of the opening, and study to promote any tendency of this nature as far as possible. The artificial palates should therefore always be attached to the teeth, and should never be fastened by metallic springs, or by folding down wings, reclining on the floor of the nostrils, (as in the ingenious contrivance of Mr. Weiss,) as by the constant pressure which these exert, the delicate, spongy bones may be injured, and the opening will invariably be enlarged.

An artificial palate, when successfully constructed, is deservedly considered as one of the most beneficial operations which the dentist can perform. It will be productive of the greatest advantage to the patient, and enable him to articulate, always with considerable, often with perfect distinctness; and will materially remove the evidence of an affliction which is equally distressing to the subject of it, and to the observer.

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## CHAPTER IX.

### OF NEURALGIA, OR TIC DOULOUREUX.

ALTHOUGH this affection more properly falls under the notice of the physician than that of either the surgeon or the dentist, yet it will be proper to mention it before concluding the subject of the diseases of the teeth, with which it is so frequently connected.

The disease, to which the names of neuralgia and tic douloureux have been applied, arises from some peculiar and mysterious affection of the nerves. The whole of these appear to be subject to it, as it is occasionally observed in different parts of the body; but the branches of the fifth and seventh pairs of nerves, which are distributed to the muscles of the face, are most frequently affected.

The origin of this disease is involved in the greatest obscurity, and very little is hitherto known of it. By some authors, it has been supposed to proceed from derangement of the digestive functions; while others believe that it arises from pressure on the nerve. This latter opinion is considered to be corroborated by the more recent discoveries of Sir Henry Hallford, who, with that minute observation for which he is so distinguished, remarked a peculiar amygdaloid thickening of the inner table of the

skull, in several instances in which the individuals had been subject to this disease. But neither of these explanations will account for the peculiarities which tic douloureux exhibits. For if the disease arose from derangement of the digestive organs, the whole of the nerves, it may be imagined, would be equally affected by it, and especially the great sympathetic nerve, and those which are more immediately connected with the abdominal viscera; and yet these rarely become the subjects of neuralgia. On the other hand, if it be produced by pressure, and particularly that which is occasioned by the thickening of the inner table of the cranium, the whole of the cerebral nerves would be equally subject to it; nor would this account for the circumstance of the disease occasionally appearing in those parts which are more remotely connected with the head, as in the arm, or in the heel, as recorded by Mr. Bell. The latter theory, however, is undoubtedly the most probable, and is confirmed by the fact, that all the symptoms of tic douloureux are frequently produced by the pressure on the nerve, which has been occasioned by the improper stuffing of a tooth.

But the most extraordinary feature of tic douloureux is, that, notwithstanding the dreadful suffering it gives rise to—which may be said to be the most acute to which the human frame is liable,—not the slightest appearance of disease can be observed in the affected nerve. There is here no trace of any of those marks of inflammation which are observed in other structures of the body when excited, or in the nerves themselves in cases of tetanus or locked-jaw. On dissection of those who have suffered from neuralgia, no morbid indication can be seen in the nerve which was the subject of the irritation; but, on the contrary, it seems to have been equally healthy with any of the others, and presents exactly the same appearance. This circumstance, it must be admitted, is adverse to the supposition of the disease being produced by pressure on the nerve, which, it may be inferred, would leave some inflammatory trace; and shews that tic douloureux originates from a source which is so subtle, that it has as yet escaped our observation.

In those cases, however, of what may be termed local neuralgia, or an affection exceedingly analogous to it, arising from the irritation produced by the improper stuffing of a tooth, when the gold, or artificial substitute presses on the nerve, the ordinary marks of inflammation are observed both in the excited nerve, and the sheath in which it is enclosed.

In describing the symptoms of tic douloureux, I shall mention those that usually occur, when the sub-orbital nerve, the most frequent seat of the disease, is affected.

The pain is altogether *sui generis*, and far exceeds in intensity that of any other disease. It appears to proceed chiefly from

the small grinding teeth, and extends along the course of the branches of the nerve in the face, shooting high into the temple, in the direction of the ear. The branches of the inferior maxillary nerve are either at the same time affected, or sympathize with those of the sub-orbitary; as the same sensation is generally experienced in the teeth of the under jaw, extending down the neck as far as the arm, to which it is also sometimes communicated. The pain, in some cases, occurs in paroxysms, and is periodical in its attacks; in others, it is incessant, or the interval is not so distinctly marked. While the paroxysm lasts, the suffering is of the most acute description; but when over, a period of comparative relief succeeds, and frequently the pain subsides altogether, until the recurrence of the paroxysm, which is often observed to return daily at regular periods. In those instances in which the paroxysm is not so strikingly indicated, the pain is more constant, and frequently equally great. In all cases, the digestive organs are generally much deranged.

In some persons there seems to exist a constitutional tendency to tic douloureux, which will readily be brought into action by certain exciting causes. This disease appears to be materially influenced by the state of the mind, and is often accelerated or occasioned by severe mental affections. It is especially apt to occur during periods of great anxiety, or long and intense depression, incidental on grief, misfortune, or disappointed hope. Or if the disease had previously existed, it will always be increased by these affections, and can seldom be alleviated while the mental disquietude remains undiminished.

#### TREATMENT.

Many remedies have been proposed for the alleviation of this dreadful disease, and almost all of them have been found to fail. The carbonate of iron, suggested by Mr. Copeland Hutcheson, was formerly considered a specific; but, in many cases, it has been productive of little benefit, and in all, its exhibition is attended with this disadvantage, that the medicine requires to be increased in quantity, in every successive administration, until at last so large a dose is requisite, that it materially disturbs the functions of digestion.

From the circumstance of the disease generally assuming an intermittent character, the exhibition of bark was naturally suggested; and it has in many instances been highly beneficial, especially under the form of sulphate of quinine; doses of which, to the extent of three grains, repeated several times a-day, are often productive of the greatest advantage.

The exhibition of arsenic, in the form of the solution, has been

proposed with the same view, and several instances of its success are recorded. But the alarming constitutional excitement which this powerful agent so invariably occasions, must in a great measure prevent it ever being generally used.

The principle of counter irritation has been resorted to with considerable success in the treatment of tic douloureux. The oxymuriate of mercury is most commonly used for this purpose. It is applied to the cheek in the form of an ointment, composed of from one to two drachms of the oxymuriate to one ounce of common cerate. A great disadvantage, however, attends its use,—it is always productive of much deformity. The moxa and issue have long been beneficially employed in cases of neuralgia affecting the loins and other parts of the body.

The division of the excited nerve, as suggested and accomplished by Sir Astley Cooper, is another mode of local treatment of tic douloureux. A similar operation has for a long time been performed with success, by veterinary surgeons, for the cure of an affection of this nature in the horse, and in Sir Astley's case, the division of the sub-orbital branch afforded the anticipated relief. It has been equally successful in several subsequent instances, when re-union of the divided nerve has not followed. But when the divided extremities of the nerve again unite, the symptoms of the disease have been generally found to recur. This event may, however, be readily prevented by removing a small portion of the nerve, instead of merely cutting it across. In both cases, however, the operation is attended with the unfortunate result of producing total paralysis of that side of the face on which the nerve is divided.

As this disease is always attended with more or less derangement of the digestive functions, it will be necessary to bring these into more regular order, before any cure can be effected. With this view, a slight course of alterative and cathartic medicines may be prescribed.

The cathartic pills with calomel, of the late Mr. Abernethy, are well adapted for the purpose; and a small proportion of opium, hyosciamus, or some similar anodyne, may be added, to tranquillize the nervous excitement.

If any mental disquietude exists, every effort should be made to suppress or alleviate it. The patient ought to be prevailed on to mingle with society, or, what is perhaps preferable, have recourse to a change of scene. Travelling is thus highly beneficial, and the symptoms of the disease will often be much ameliorated by a tour.

In those instances of local neuralgia which are produced by the improper stuffing of a tooth, at a time when the nerve is exposed and subjected to the pressure of the gold, and which are

so often occasioned by the empirical practice of "plugging" teeth, when in a state of the highest excitement, with what are termed "anodyne or mineral cements," composed of the coarsest metals, no relief will be derived from any other treatment excepting the extraction of the tooth ; and in every instance the sooner that this is effected the better. In those cases in which symptoms, resembling those of tic douloureux, arise from exostosis of the teeth, or from the irritation of a carious root, the same course must be followed.

## PART III.

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### OPERATIONS ON THE TEETH.

WHILE describing the different diseases of the teeth, I mentioned various operations that were requisite for their cure. I did not think it necessary to interrupt the course of the description, for the purpose of then detailing the mode in which these are performed; conceiving, that for the convenience of reference, it would be better to comprehend them in a different part of the work. I shall now, therefore, proceed briefly to notice them.

I may be permitted to premise, that, in performing these operations, the fewer instruments that are used the better; and that no unnecessary exhibition of them should ever be made. I am aware that this recommendation is diametrically opposed to the practice of all the empirical, and but too many of the respectable portion of the profession; but yet I believe, that although such ostentatious parade, on the part of the operator, may, in a few instances, startle the timid and bewilder the ignorant, it will only excite the merited ridicule and contempt of the great majority of his patients.

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### CHAPTER I.

#### SCALING AND CLEANING THE TEETH.

1. THESE are the operations required for the removal of the tartar, or any other foreign body, which may have collected upon the teeth; and however easy of performance they may at first appear, no one but a regularly educated practitioner ought ever to be allowed to undertake them; as the advantage to be derived from them, and the permanency of the teeth, in a great measure depend on the mode in which the operations have been performed.

2. It has been already stated, that the tartar, when first deposited on the teeth, is so soft, and adheres so slightly, that the friction produced by the motion of the tongue, or of a common tooth brush, would be sufficient to remove it. But the position of the

teeth, in some parts of the mouth, prevents either from being effectually applied, or even touching a considerable portion of their surface. We thus constantly observe tartar accumulated, in a greater or less degree, in almost every individual, on the sides and posterior part of the incisors, canines, and small grinders of the under jaw, and on the outer surface of the molares of the upper; on all of which it has the greatest tendency to be formed, not only in consequence of a great part of their surfaces being beyond the reach of the tongue, but also owing to their immediate location to the principal reservoirs of the saliva.

3. When the smallest quantity of tartar adheres to the teeth, it rapidly becomes hard, and forms a nucleus for future deposition. This, if not prevented, will frequently increase, until several of them are completely covered, or enveloped in a mass of the secretion. The gums are kept in a state of constant irritation by the presence of the calcareous body. The sockets are absorbed, and the teeth, being thus as it were undermined, will inevitably be lost, unless the tartar is removed.

4. The instruments by which its removal is accomplished, are termed scalars. They are of various forms, adapted to the respective aspects and position of the different teeth.

5. These instruments, it should be observed, are not intended to scrape down the tartar, which has now become so hard, that any attempt of this kind would be vain. The mode of using them is to apply the edge of the instrument to the free part of the tooth, underneath the calcareous deposit, or between it and the gums; when, by a slight effort, the tartar will readily be started off in scales from the surface. It will facilitate the operation, to remove the concretion completely from one tooth before commencing with another, and care should be taken that the whole of it is scaled off, for if the smallest particle is allowed to remain, it will irritate the tongue and gums still more than before the operation, and contribute to a future formation.

6. Frequently the tartar is collected in such quantities, as to afford an adventitious support to the teeth. In these cases, the removal of the whole of it ought not to be attempted at one operation, but may be beneficially effected at several subsequent periods, an interval of a few days being allowed to elapse between each attempt.

7. After the removal of the tartar, the surfaces of the teeth generally feel rough to the tongue, and an unpleasant feeling of compression is experienced by the patient, in consequence of minute particles of the substance remaining between the sides of the teeth. The former of these annoyances may be removed by slightly rubbing the surfaces of the teeth with a cane and a powder consisting of equal parts of pulverized pumice-stone and le-



vigated chalk ; and the sensation of compression will be diminished by passing a common spring tooth-pick between them.

8. The gums usually feel tender on exposure to the air after removal of the tartar. This slight uneasiness always subsides in the course of a few days ; and may be alleviated by washing the mouth with any of the following lotions :

℞ Tinct. Myrrh, ʒ vi.  
Mistur. Camphorat. ʒ viij. M.

℞ Tinct. Cinchonæ, ʒ ss.  
Vini Rubri Lusitan.  
Aq. Fontis â â ʒ iij. M.

℞ Tinct. Myrrh, ʒ vi.  
— Cinchon. ʒ ss.  
Infus. Rosar. ʒ iv.  
Aq. Fontis, ʒ vi. M.

9. That peculiar dark colored incrustation, which is so often observed on teeth that have been neglected, especially on those of youth, adheres with so much tenacity, that it cannot be scraped off with an instrument without the risk of injuring the enamel. The only safe mode of removing it, is by the patient use of the cane and pumice-stone powder, or the teeth may be cautiously rubbed with a piece of the pumice-stone itself.

10. When the tartar has been removed, and the teeth restored to their natural color, their preservation in this condition may be greatly maintained by attention to the use of the tooth-brush, and some innocuous powder, that will act slightly on the teeth by a gentle friction.

11. The chalk and pumice-stone powder already mentioned is far too powerful for frequent application. The tooth powders that are to be daily used, should consist of some impalpable substance, that will neither act chemically upon the structure of the teeth, nor too powerfully on their surfaces by friction.

12. Charcoal and camphor, orris root and levigated chalk, bark and finely pulverized cuttle fish—all answer the purpose equally well, and are the substances of which most tooth powders consist ; some of the fragrant essential oils being usually added, to render them more agreeable. All those powders that are recommended for the purpose of rendering the teeth white, should be sedulously avoided, as they can only produce this effect by acting chemically upon the enamel and destroying its structure.

13. It may here be observed, that in cleaning the teeth, no attempt should ever be made to render them whiter than they naturally are. All those substances that produce this effect, can only do so by their acidity ; and it has already been mentioned how in-

juriously the acids act upon the teeth,—at first rendering them preternaturally white, but in a short time more discolored than before, and ultimately so sensitive and irritable that they are a source of annoyance to the patient as long as they remain in the mouth.

14. With regard to tooth-brushes, they should neither be too hard nor too soft, as the former act too powerfully on the teeth, and irritate the gums, and little or no benefit will be derived from the latter. Those that are intermediate between either extreme, and whose bristles are considerably apart from each other, are of the most advantageous form.

15. Notwithstanding all the efforts of the individual, the tartar often, from some peculiar tendency, collects so rapidly, that it becomes necessary to scale the teeth every two or three months, and, it will always greatly contribute to their permanency, to have the tartar removed from them at least once a year.

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## CHAPTER II.

### OF STUFFING THE TEETH.

*With Remarks on the Poisonous Properties of the "Anodyne and Mineral Pastes" used for this purpose.*

16. THIS operation consists in filling up, by artificial means, the cavity which caries has produced in a tooth, and if properly performed, it is one of the most beneficial which the dentist can achieve, as the decay may often be thus arrested in its progress, and the preservation of the tooth prolonged for years.

17. The success attending the operation depends on several circumstances,—as, the nature of the foreign body by which the cavity is filled, the favorable condition of the tooth, the entire removal of the carious part, and the complete exclusion of the air and saliva from the interior of the cavity.

18. A great variety of substances have been used for stuffing teeth; and empirical practitioners are daily announcing the discovery of new ones, and publishing glowing descriptions of the "wonderful efficacy" of their nostrums, although in reality every one of them is generally infinitely worse than those which preceded it.

19. Of all the materials that have been employed for this purpose, gold leaf, the most ancient, is still incomparably the best, as it is not only the purest of all the metals, but is possessed of the highly valuable property of undergoing no change in the mouth, where almost every other metallic substance is affected.

Platina the more recently discovered metal, and inferior only to gold, it is true, forms an exception to this remark ; but it is rarely to be found in a state of purity, and is even then possessed of much less ductility than gold is.

20. All the other metals are more or less objectionable. Silver and tin rapidly undergo oxydation on exposure to the air and saliva. Lead is still more improper, as it is readily decomposed by the saliva, and many fluids in ordinary use for culinary purposes, such as vinegar, &c.; and, when thus carried into the stomach, it may prove dangerous in the highest degree.

21. Notwithstanding the well known deleterious effects of lead, it is constantly employed by empirical practitioners in the composition of what they advertise as "anodyne cements" and "mineral pastes." These generally consists of oxydes of lead in union with mercury, or of cobalt with plaster of Paris ; the compound thus formed being at first soft, but soon becoming hard on exposure to the air and moisture of the mouth.

22. Laying their poisonous tendency altogether out of the question, the mode in which these wretched farragoes are applied, renders it impossible that they can ever be productive of the smallest benefit. The persons who use them rarely take the trouble of removing the carious part of the tooth, but, on the contrary, boast that they cover it up with their nostrum. The unscientific nature of this practice will at once be obvious ; as it is well known that if the smallest particle of the decayed part is left, the source of contamination still remains, and the disease will go on in the interior of the tooth as rapidly as ever.

23. Another mode of stuffing teeth was proposed several years before ; indeed, I believe as long ago as the time of the late Mr. Fox. The material used was a composition formed by the union of tin with several similar metals. The compound thus made becomes fusible at a considerably lower temperature than any of the metals that compose it. A small piece of it being placed in the cavity of the tooth, is readily melted by the application of a heated iron wire.

24. The practice, I believe, has now been discontinued, although it is far less reprehensible, and infinitely more effective, than the empirical one that has been substituted for it. The chief objections to its use are, 1st, The irritation in the tooth which the application of the heat frequently produces ; 2d, The contraction which takes place in the metal on cooling, by which it generally happens, that the cavity is not so completely filled up as to exclude the air and saliva from the interior of the tooth ; and, 3d, The limited practicability of the operation, even if it were invariably successful, as the power of gravitation will prevent it being applied to any of the teeth excepting a few of those in the under jaw.

25. A tooth is in the most favorable condition for being stuffed at the time when a dark colored spot in the enamel indicates that caries has commenced in the osseous structure beneath, although it has not yet made an opening externally, nor advanced so far internally, as to have exposed the canal of the tooth. In this early stage, the cavity can always be filled up with the greatest advantage, and generally without the least pain to the patient, as the sound plate of bone interposed between the canal and the carious part completely prevents the pressure of the gold affecting the nerve.

26. The first part of the operation of stuffing consists in removing all the decayed part of the tooth, by means of broaches of a triangular or pentagonal form; or, if the situation of the caries will not permit of the application of these, excavating instruments must be used for the purpose of cutting it away. These instruments, of course, must be of different forms, adapted to the various aspects which carious teeth present, and should consist of two sets, one of which is required for applying to the right side of the opening, and the other for the left.

27. In excavating the cavity, although it is necessary to clear away the whole of the diseased structure—and it is desirable to make the interior of the opening as equal as possible—yet it should be the study of the operator to avoid removing any of the sound part of the tooth, with the view of rendering the space wider beneath than it is at the surface. I am aware that this recommendation is contrary to the practice of almost every dentist, and that many authors (among whom I am surprised to find so scientific a man as Mr. Bell) even inculcate the propriety of making the cavity larger below than at its orifice, for the purpose, as they state, of more effectually securing the gold. I am convinced that the result of this practice is generally the reverse of what they anticipate, and believe it to be utterly impossible, that a cavity, which is wider in the interior than at the surface, can ever be so accurately filled up by the introduction of a solid body, as a cylindrical opening will be. In the former instance, it will frequently happen that the gold fills the space so inadequately, that, although it will not be apt to fall out, it soon becomes loose, and moves about; of course admitting of the entrance of the air and saliva into the interior of the tooth, and thus destroying the whole effect of the operation.

28. When the cavity has been duly prepared, it is to be thoroughly cleared of all moisture and extraneous matter by wiping it out with a little cotton lint wrapped round a small probe, or on the point of one of the excavating instruments. On the removal of this lint, the gold leaf is to be immediately inserted, and placed in contact with the extremity of the cavity. The

rest of it is to be gradually introduced, and equally pressed down, until the whole of the space is accurately filled, when the superfluous metal is to be cut away, and the surface of it polished with the burnishing instrument.

29. Care must be taken not to introduce too much of the gold at once, as the orifice of the opening may thus be blocked up, and the space beneath it left vacant. If this should occur, the effect of the operation is rendered useless, and the stuffing will soon fall out.

30. It should be the aim of the operator to have the whole of the metal inserted in one continuous piece, as it has then a much better chance of remaining firm, than if several detached fragments have been introduced.

31. In most cases, the gold leaf which is in common use for this purpose, is sufficient; but when the opening is large, a thicker sheet may with advantage be substituted. The metal should previously be thoroughly softened, by placing it on a plate of iron heated to redness, to give it the requisite ductility; and the leaf should be lightly rolled up before being introduced into the tooth.

32. In filling up the cavity of a carious tooth, the greatest care must be taken that the artificial body never comes in contact with the nerve. If this precaution is neglected, and the practitioner has the rashness and cruelty to persist in pressing down the metal, notwithstanding the writhing agony of his patient, the most dreadful suffering will inevitably follow. The pain thus produced is so exquisitely acute, that it has frequently been mistaken for that of *tic douloureux*, and this kind of irritation has often given rise to symptoms resembling those of that fearful disease. In these unfortunate cases, the immediate extraction of the tooth is the only way of affording relief; as the mere removal of the gold will not be sufficient to allay the irritation which the pressure of it occasioned.

33. The practitioner must also beware of attempting to stuff a tooth while its nerve is in a state of excitement, as the only effect of the operation then, will be to increase the pain in a tenfold degree. If the irritation is severe, it is infinitely better to extract the tooth at once, than to resort to dilatory and generally useless measures, for the purpose of allaying the pain, with the intention of afterwards filling up the cavity. Indeed, the patient will generally insist on having the tooth removed.

34. In those cases in which the pain is more moderate, and where it is an object of importance to preserve some particular tooth, recourse may be had to those means which were formerly mentioned as occasionally useful in alleviating toothache; and whenever the irritation has subsided, the cavity may be permanently filled up.

35. Before concluding, I have only to remark, that although it is impossible to predict that success will invariably attend the operation of filling up of the cavity, yet if it has been adequately performed, and in favorable circumstances, the patient may, in the great majority of cases, anticipate a beneficial result. Instances are by no means unfrequent in which teeth have been in this way preserved for many years; and several well authenticated cases are on record of their remaining thus in the mouth for upwards of a quarter of a century, without undergoing farther decay.

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### CHAPTER III.

1. *Of Filing the Teeth.*—2. *Of Tying the Teeth.*—3. *Of Cauterizing the Nerve—Disadvantages of the Actual and Potential Cauteries—Preferable Mode of Destroying the Nerve.*—4. *Scarification of the Gums.*

#### OF FILING THE TEETH.

36. THE cavity produced by caries is sometimes so superficial that it will not admit of being filled up by artificial means. This is especially observed when the disease commences on the sides of the upper incisors, in consequence of the pressure which the teeth exert on each other. In this instance, the decay invariably goes on with great rapidity, if means are not taken to prevent the carious portion affecting the sound part of the tooth beneath it.

37. The form and conspicuous situation of these teeth will rarely permit of their being adequately stuffed; and indeed the extensive surface which the caries, in such a case, usually presents, will almost always prevent the operation being properly performed. It therefore becomes necessary to remove the affected part with the file, as the only mode of retarding the advance of the disease.

38. Considerable portions of the teeth may thus be cut away, without endangering their vitality, or impairing their external appearance, if the instrument has been dexterously used. In the first stage of the disease, the operation requires but little ingenuity, as it is merely necessary to make a small space, by passing a smooth file between the teeth. But when the caries is more extensive, considerable care is requisite to effect the removal of the diseased part without materially altering the outward aspect of the tooth.

39. The files used for this purpose should be perfectly smooth on one of their surfaces, so that, when passed between the teeth,

they may cut away the posterior part of the affected tooth, without injuring the front of the adjoining sound one.

40. It should be the object of the operator to make the sides of the space as smooth and equal as possible, that it may not readily entangle the particles of the food; and care must be taken by the patient to keep it in a state of purity. A small brush, formed by a single row of bristles, will be found useful for this purpose; and a little cotton lint, moistened with the camphorated spirits of wine, may be occasionally applied with advantage.

#### OF TYING THE TEETH.

41. The application of a ligature to the teeth, is frequently productive of the greatest advantage, when their stability has been impaired by the effects of a course of mercury, or they have become loose in consequence of the natural absorption of the sockets from age. In those cases also in which the teeth have been displaced by external violence, either accidentally by a blow, or culpably by the careless extraction of an adjoining tooth, it becomes necessary to tie them to the adjacent firm ones, until they re-adhere to the sockets.

42. The material employed for this purpose, is a thin silk cord, known by the name of "dentist's twist." It is preferable to the common gut, or Indian weed, which were formerly used.

43. The only attention requisite in the application of the ligature, is to place the knot in such a situation that it may not interfere with the motions of the tongue or lips. This becomes an object of considerable importance in tying the teeth, when several, or the whole of them, are loose, and the ligature is to remain for a length of time.

44. The mode of proceeding is, to enclose the neck of the posterior tooth in the cord, which is to be fastened by a double, or, what is infinitely preferable, a sailor's knot, on the anterior side of the tooth. The ligature is to be extended in the same way to the rest of the teeth, until the whole of them are enclosed. The knot being thus placed between the sides of the teeth, no inconvenience will be occasioned by its presence.

45. Trifling as this slight operation appears, it is always highly conducive to the comfort of the patient, as the teeth will thus be rendered comparatively firm, and retained for a considerably longer period than they otherwise would have been.

#### OF DESTROYING THE NERVE.

##### *Inadequacy of the Actual and Potential Cauteries—Preferable Mode of Performing the Operation.*

46. It frequently happens, that the practitioner is under the necessity of effecting the destruction of the nerve, when it has been

exposed by caries, or in fractures of the teeth by external violence. The operation is especially called for in the instance of the upper incisors and canines, when it becomes an object of importance to retain the roots, for the purpose of pivoting other teeth upon them. In all other cases of exposure of the nerve, by fracture or by caries, it is infinitely less painful, and a much more scientific practice, to extract the roots at once, than to make any attempt to allay the irritation by destroying the nerve.

47. The destruction of the nerve is usually accomplished either by the actual or by the potential cautery; but it may be much more easily effected by the mode which I shall afterwards mention.

48. The actual cautery has, in this country, been justly banished from almost every surgical operation, and is now, I believe, only retained for destroying the nerves of the teeth, and as a mode of stopping hæmorrhage from wounds of the tongue. Whether it may be necessary in the latter instance or not, it is for others to determine; but as far as the teeth are concerned, it may well be dispensed with.

49. The objections to its use are its formidable and barbarous appearance, and, in most cases, its total inadequacy. The latter, it has been already stated, is caused by the smallness and the tortuous course of the dental canals, which render it difficult to introduce the cauterizing instrument into them; and even if this should be readily accomplished, its temperature is generally so diminished by the time that it is inserted, that it is inadequate to effect the instant destruction of the nerve on coming in contact with it, and the ineffectual attempt only increases the irritation.

50. When it is necessary to attempt to destroy the nerve by means of caustics, (a practice, to say the least of it, of exceedingly doubtful expediency,) the nitrate of silver is best adapted for the purpose. It may be used, either by placing a small piece of it within the opening in the tooth, or by applying it with a hair pencil in a state of strong solution. The cavity should be wiped out, if practicable, with a little cotton lint, before the caustic is applied; and care must be taken to prevent the salt diffusing and injuring the adjoining parts. It will be observed, that the application of the potential cautery is confined to the teeth of the under jaw, and that the principle of gravitation will prevent it from being employed in the instance of the upper.

51. An infinitely more effectual, and far less painful mode of destroying the nerve, is to crush it at once by the introduction of a small trocar, or a common broach. It is surprising that this simple and efficacious plan should not have been suggested before. The pain attending the operation is but momentary, as the nerve is wholly destroyed by a single turn of the instrument.



## SCARIFYING THE GUMS.

52. The mode of scarifying the gums of children, and the benefit which results from the practice, have already been mentioned, while describing the treatment necessary for alleviating the dangerous symptoms of the first dentition. The operation merely consists in making a semi-lunar, or two crucial incisions over the distended part, with a gum lancet. A small fleam-shaped instrument is best adapted for the purpose, and it should always be carried to such a depth, as to meet the crown of the tooth beneath.

53. It is occasionally of much benefit to remove, at the same time, a small portion of the gum, with a pair of scissors, especially in those cases of severe irritation of it, occasioned by the advance of the wisdom teeth.

54. When it is necessary to scarify the gums, in consequence of their being in a spongy state, and overcharged with blood, the incisions should be made in a perpendicular direction, between the roots of the teeth. The vessels are thus not only more effectually divided, but the contraction of the wound, when its sides unite, assists in removing the tumidity of the gum.

55. The common practice of cutting the gum with a lancet, preparatory to extracting the teeth, ought never to be followed. It is, in every instance, an unnecessary infliction of pain on the patient, and an obstruction to the operator himself, as the bleeding prevents him observing whether the instrument is adequately placed upon the tooth.

56. If it is considered requisite to separate the gum, before attempting extraction, an instrument similar to a *tenaculum* should be used for the purpose; but the practice is almost always unnecessary, as the force that is sufficient to withdraw a tooth from its socket, will readily sever the comparatively slight attachment which subsists between it and the gum.

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CHAPTER IV.

## EXTRACTION OF THE TEETH.

THIS operation is the oldest of all that have been performed on the teeth, and is perhaps one of the most ancient of any in the practice of surgery. It can also boast of having proved attractive to a far greater variety of "operators," than any other upon record; all classes, from the embryo apothecary to the blacksmith and the barber, having occasionally attempted it, and contended for its monopoly. The advance of refinement, and the division

of labor, have gradually caused the two last amateur practitioners to relinquish their claims, and retire from the field ; but their departure has not been attended with loss to the community at large, as the majority of the *soi-disant* "surgeon-dentists" of the day are eminently qualified to occupy their places,—the former pursuits of many of whom, before their professional metamorphosis, having been still more unqualifying than either those of the blacksmith or of the barber were.

The difference between the practice of such persons and that of the surgically educated practitioner, will readily be discovered by the result. The former, indeed, will, by mere force, and the rashness which ignorance inspires, often "pull out" a tooth, without any serious injury to the patient ; although severe contusion and laceration of the gums, extensive splintering of the alveolar processes, and the removal of unaffected teeth, are more frequently the results of their violence ; while the latter, by his anatomical knowledge of the parts, is enabled to perform the operation with infinitely less pain to the individual, and without any of these unfortunate occurrences.

57. The instruments that are required for performing extraction, are the tooth-key, the forceps, and elevator, or punch. An endless variety of form and modification of these instruments are to be found, almost every dentist having conceived it to be necessary to invent something of his own, and in numerous instances been influenced by the vanity of attaching his name to what he thinks proper to term "improvements," which, in nine cases out of ten, will be considered to be the reverse, by every one excepting himself.

58. The tooth-key is an old invention, or rather a modification of the ancient and obsolete instrument known by the name of the "paces ;" and although it is now the fashion to despise and abuse it, (especially with those persons, as Mr. Bell well remarks, who secretly resort to its use,) it is, unquestionably, still the safest, and, perhaps, also the most useful of all the instruments that are employed for the extraction of the teeth.

59. The remark I have made of the inconvenience and annoyance which are occasioned to the student, by the suggestions of those persons who are so much more industriously engaged in altering and inventing instruments, than in qualifying themselves to use them, can nowhere be better illustrated than in the case of the tooth-key, which has, in many instances, been rendered almost wholly useless by their contrivances. No other example of this need be adduced than that afforded by the additional fulcrum, which was proposed some years ago, with the view of removing the pressure from the affected tooth, to the adjoining sound ones on each side of it. In consequence of this "improvement," it

generally happened that these teeth were severely injured by the operation, and, I believe, it not unfrequently occurred that the whole three teeth were turned out instead of one.

60. In the common tooth-key, the body of the instrument is hollowed, to admit of a director, which passes through it, and should project about a quarter of an inch beyond the fulcrum. This projecting point is intended for occasionally fixing the claw beyond the extremity of the instrument; a practice which is often exceedingly useful in those cases in which it becomes necessary to remove the wisdom teeth of the under jaw with the key, when the coronoid process of the bone will prevent the fulcrum from being placed opposite to the tooth. To the other extremity of the director, a small semi-circular appendage is attached, which enables the operator to guide the movements of the claw with the index finger of the hand in which the instrument is held, and leaves his other hand at liberty for the support of the jaw.

The tooth-key may be used for the extraction of all the molares excepting the upper wisdom teeth, and it is well adapted for removing the bicuspidés, when they are in so carious a state as not to admit of the application of the forceps.

The forceps is also a very ancient instrument, and is perhaps the most original of all, as it may naturally be supposed to have been the implement employed by those "artists" who formerly took a share in performing this operation.

61. It will be requisite for the practitioner to be provided with several pairs of these instruments, varying in size and construction, according to the form and position of the teeth to which they are to be applied. Thus, a straight pair, with a somewhat semi-lunar and pointed extremity, will be required for the extraction of the upper incisors, canines, and bicuspidés; another pair, with a crow-beaked form of point, is better adapted for the removal of the corresponding teeth of the under jaw. The superior molares are extracted by a pair of strong forceps of a peculiar construction; and a fourth modification of the instrument, or what, from its shape, is named the "hawk's bill" forceps, is requisite for the removal of those teeth in the lower jaw.

62. The extremities or points of all these forceps should be hollowed within, in order to apply, with some degree of accuracy, to the convex surfaces of the bodies of the teeth; and the handles of them should be made much broader, and nearer to each other, than those of the instruments in common use, as they will thus be more firmly retained in the hand of the operator.

63. The forceps is a far more difficult instrument to use than the tooth-key; although this will not, at first sight, be evident, on looking to their respective constructions, or attending to the mode in which they act; as the forceps removes the teeth perpendicu-

larly from their sockets, and the key always withdraws them, in a greater or less degree, in a lateral direction. But it will soon be discovered on a comparative trial of the two; and the operator will find, that, in applying the forceps, great caution is necessary, to avoid the danger of breaking the tooth, and considerable experience is required to enable him to use the instrument with facility. But when a command of it is once acquired, it is undoubtedly the most applicable of all those that are employed for the extraction of the teeth.

64. The elevator, or punch, is the instrument required for the removal of the roots, when the bodies of the teeth have been destroyed by caries, or broken over, either by accident, or by ineffectual attempts at extraction.

65. In using this instrument, the greatest care is necessary to prevent it starting from the tooth, and injuring the adjoining parts. In order to guard against this accident, the greater part of the blade, and the whole of the handle, ought to be firmly grasped by the hand of the operator, a small portion of the instrument only being left free, for application to the root. It will also be well, as an additional security, for the practitioner to place his finger before the point of the instrument, to prevent the possibility of the serious injury that might occur if it should happen to start, either from want of caution on the part of the operator, or in consequence of the restlessness of the patient.

66. Many unsuccessful attempts have been made to construct an instrument by which the teeth might in every instance be perpendicularly withdrawn from their sockets. I have seen several contrivances for this purpose, and can give no better idea of their complicated structure, than by comparing them to a steam engine on a small scale, or to the mysterious machine with which Hogarth decorates the studio of the charlatan, in *Marriage à la Mode*. The formidable dimensions and appearance of such an instrument must always prevent it being generally used, or indeed ever being applied to a patient of ordinary delicacy. But even if these insuperable objections could be surmounted, there are many cases in which it could never be employed without increasing the difficulty and pain of the operation. The large grinders of the upper jaw, for example, from the irregular form of their roots, and the mode in which they diverge, could scarcely ever be removed from their sockets in a perpendicular direction, without extensive fractures of the alveolar processes.

I shall now proceed to mention the manner in which these various instruments are used, and the mode in which the different teeth will be most easily extracted. In stating this, I am far from intending to assert, that the practice which I am about to detail is preferable to what other practitioners may follow, as

almost every one has some slight modification of his own, which he believes to facilitate the operation. The following suggestions, however, are entirely of a practical nature, and may, with safety and advantage, be followed by the student, or by the general practitioner whose other avocations may have prevented him acquiring an adequate knowledge of the teeth, and thus induced a reluctance to undertake their extraction.

#### EXTRACTION OF THE TEMPORARY TEETH.

67. The whole of the temporary teeth are, in almost every instance, easily removed by the forceps. For those of the upper jaw, the small straight instrument may be used; but a curved pair will generally be more applicable to the under. In those cases where the bodies of the teeth have been destroyed by caries, and when it becomes necessary to extract the roots in consequence of the irritation which they cause, a small elevator should be used, if the fangs are so delicate as to be crushed by the pressure of the forceps.

68. The only difficulty which is experienced in extracting these teeth is that occasioned by the restlessness of the little patient, whose terror is so often excited, and always increased, by the ostentatious parade on the part of the practitioner. No formidable-looking machine, known by the name of an "operating chair," should ever be used on this occasion, or indeed on any other, as the appearance of this unnecessary appendage, although by many dentists it is considered one of high importance, always raises an unpleasant sensation in the mind of the patient. An ordinary *negligée* reclining chair is completely adequate in every instance, and on the present occasion, even this may be dispensed with; as the operator had much better seat himself on a common chair, and secure the child with one arm, while he removes the tooth with the other.

69. I have already observed, that the extraction of the temporary teeth ought never to be resorted to, excepting in cases of the most urgent necessity; not only because it is well to avoid performing any operations during those early years, when the constitution is so liable to excitement, but also on account of the connection which subsists between the first and second sets of teeth, which renders it an object of importance to preserve the former as long as possible, in order to allow time for the proper development of the latter, and for the increase in size of the maxillary bones, which is required to enable the permanent teeth to come in, in a regular direction.

## EXTRACTION OF THE PERMANENT TEETH.

70. The permanent incisors of the upper jaw are in general easily removed by the straight forceps. The instrument is to be fixed as high up on the root as the gums and socket will allow, and by a slight rotatory motion in one direction, accompanied with a gradually increased extracting force, the tooth will be readily withdrawn.

71. Care should be taken that the pressure of the instrument is not so great as to endanger fracture of the tooth; and no attempt should ever be made to remove a tooth by a sudden jerk, as the breaking of it will be the inevitable result.

72. The inferior incisors are removed in a somewhat different manner, although quite as easily, by the "crow beak" forceps. The convex or longest blade of the instrument is to be placed on the posterior part of the root; but instead of the rotatory motion, which the flatness of the sides of these teeth would not admit of, without seriously fracturing the socket, a slight movement is to be made in an anterior and posterior direction, in union with the extractive effort, and the tooth will be easily brought out.

73. It frequently happens that these teeth are so irregular and crowded, that forceps of the ordinary size cannot be applied. When this occurs, a smaller and thinner pair may be tried, or the tooth may perhaps be laid hold of by its sides, by means of the common straight forceps. If the latter should also be inapplicable, the elevator must be resorted to. The point of the instrument is to be inserted as deeply as possible between the tooth and its socket, and a lever being made, by resting either on the alveolar process, or on one of the adjoining teeth, the tooth will generally be turned out with ease, by the depression of the handle of the punch.

74. The canines, although very firmly attached to their sockets, are in general easily extracted by the forceps, in nearly the same way as the incisors. In the upper jaw a slight turn to one side may be made along with the exertion of the extractive effort; but in the under the flatness of the sides of the fangs, renders this movement impracticable. The teeth must, therefore, be detached from their sockets by a motion of the instrument backwards and forwards, which is to be continued until they are withdrawn.

75. The bicuspidates may be removed in nearly the same manner as the canines. In the upper jaw, however, the flatness of their sides will not permit of the least degree of rotatory motion. They are, therefore, to be moved backwards and forwards while withdrawing them. In extracting those of the under jaw, the round form of their fangs will generally admit of the slight turn which so facilitates the operation.

76. The bicuspidæ are much more liable to be broken during attempts to extract them, than any of the other teeth; and when fracture of them occurs, it is generally difficult to remove their roots with the elevator. The tooth-key, however, will always extract them with facility, especially in the upper jaw. A small sharp and semi-lunar-edged claw is required for the purpose. It is to be fixed as high up as possible on the fore part of the root; the fulcrum, or bolster of the instrument being, in this instance, placed on the inside of the alveolar process, and having a little cotton wrapped round it to diminish the pressure on the gums. The instrument being thus fixed, a slow and steady turn is to be made, and the root will readily be withdrawn in nearly a perpendicular direction.

77. The roots of the small grinders of the under jaw may be removed in the same way, although it is generally a preferable practice to place the fulcrum on the outer side. They are, however, in most cases, more easily extracted with the crow-beaked forceps.

I shall now proceed to mention the mode of effecting the extraction of the molares, which are the subjects of this operation much more frequently than any of the other teeth.

78. The molares may be extracted either by the forceps or by the tooth-key. The former is the preferable instrument, in the hands of a person accustomed to its use, and when the caries has not been extensive; but if the practitioner is inexperienced in the application of the forceps, or if the teeth have become hollow in consequence of the advanced state of the disease, the key will be found to be the safer instrument of the two.

79. For the removal of the molares of the upper jaw, and the wisdom teeth of the under, the large double curved forceps is the most useful form of the instrument; but for the first and second large grinders of the under jaw, the hawk's bill pair is required.

80. In the former instance, the instrument is to be applied as high up as possible on the root of the tooth; and when firmly fixed, a slight motion is to be made in an outward and inward direction, for the purpose of detaching it from the socket. While thus shaking the tooth, the extracting force is to be exerted, and it will generally be easily removed.

81. In applying the hawk's bill forceps, the larger or convex blade of the instrument is to be placed on the inner side of the tooth, and by inclining the handles outwards and inwards, exerting at the same time the extracting force, the tooth will be readily withdrawn.

82. In using the forceps, great care must be taken, that, in applying the force which is requisite for the removal of the tooth, no undue pressure is made upon the handles of the instrument.

This, indeed, is the secret, on the knowledge of which the successful application of the instrument depends; for if the practitioner is not on his guard to avoid exerting this pressure, the breaking of the tooth will be the inevitable result. But if he attends to the caution that has been given, he will find that the teeth will be removed with ease and safety.

83. But when the teeth are extensively decayed, or if the operator has not had that practice in the employment of the forceps which is requisite to enable him to use them with confidence, it becomes necessary to have recourse to the tooth-key. I shall now mention the mode in which this instrument is applied.

84. It has been a subject of discussion, whether the fulcrum of the key should be placed on the outer or on the inner side of the alveolar process; in other words, whether the tooth is to be extracted in an outward or inward direction. In the upper jaw it is, I think, a matter of indifference, although, *cæteris paribus*, I prefer fixing the claw on the inner side of the tooth, and extracting outwardly, because, in using the key, a small portion of the alveolar process is generally detached along with the tooth, and the socket will yield most readily on the external side. But in the under jaw it is imperatively necessary that the teeth should in every instance be extracted outwardly. It is, indeed, surprising that this should ever have been a matter of dispute, as the form of the lower jaw, and the relative position of the teeth to it, clearly indicate the necessity of extracting in this direction. Besides the receding inclination of the inner plate of the bone renders it difficult to find a fixed point for the fulcrum of the instrument to rest upon, and the dense lamellated structure of this part of the jaw prevents it yielding without endangering the occurrence of an extensive fracture.

85. Before using the key, a little cotton lint should be wrapped round the bolster of it, in order to diminish the pressure on the gum. The instrument being thus prepared, is to be applied to the tooth, its claw being fixed as near as possible to the extremity of the root, and the fulcrum placed on the opposite edge of the socket, in a line somewhat more superficial than that of the extremity of the claw. By a slow steady turn of the instrument, accompanied at the same time with a slight degree of extractive force, the tooth will readily be withdrawn from its place.

86. It is frequently of much benefit to combine the use of the forceps with that of the key, and to remove the tooth with the former after it has been started by the latter.

87. The tooth-key is, in many instances, inapplicable to the wisdom teeth, on account of the obstacle presented by the coronoid process of the lower jaw. The plan already mentioned, of advancing the claw in front of the fulcrum, is often exceedingly



useful in extracting these teeth in the under jaw, but in the upper it is generally inadmissible.

88. The *dentes sapientiæ*, above and below, are however most easily extracted by the large forceps or the elevator. In using the former, the instrument is to be applied in the ordinary way, being fixed as deeply upon the root as the gum and the alveolar process will allow, when the tooth, after being slightly shaken, will in general be easily withdrawn from its socket.

89. In removing these teeth in the under jaw with the forceps, it will facilitate the operation to apply the extracting force in a somewhat angular direction forwards, as the roots of the inferior wisdom teeth generally have this inclination.

90. But if the caries has been extensive, the elevator had better at once be used, instead of being resorted to after the tooth has been broken over by an ineffectual attempt to extract it—an unfortunate occurrence which may occasionally happen in the hands of the most dexterous operator. The point of the instrument is to be inserted as deeply as possible between the tooth and its socket, and a lever being made by resting either on the edge of the latter or on the adjoining tooth, the affected one will be easily turned out.

91. These comprehend the principal modes of effecting the extraction of the various teeth; and although in some peculiar instances, they may require to be slightly varied, yet I may safely state, that in general they will be found effective, and that I have never been under the necessity of resorting to any other means, or of abandoning the extraction of a tooth after making the attempt. Unusually difficult cases may indeed occur, such as those mentioned by Mr. Bell, who says, (p. 302,) "It has in a very few instances occurred in my practice, that the root was so far decayed as to render it impossible to reach it by the elevator applied in the usual manner. In such cases I have successfully adopted the following method of bringing it away: A crucial incision is made in the gum, as nearly as possible opposite to the apex of the root. The gum is then separated from the bone, so as to expose a very small portion of it, which is to be cut away with the point of a strong knife, till an opening is made into the alveolar cavity, and the end of the root is exposed. By placing the point of the elevator between this and the bottom of the socket, the root may be forced out through the natural opening of the alveolar cavity. In cases of alveolar abscess, combined with this state of the root, this plan may be very easily adopted, as the opening in the bone has been already effected for the escape of the pus."

I must own, however, that I never met with such a case, and that, notwithstanding the high authority from which the treatment that has been mentioned emanates, I should be extremely unwilling to put it in practice.

92. Before concluding, I may remark, that, after the extraction of the tooth, it is well to bring the sides of the gum together with the finger. This is a process, indeed, which is really attended with little or no benefit, although it is in general necessary for the satisfaction of the patient, and may afford an opportunity to the operator of ascertaining that no loose splinter of the alveolar process remains in the cavity.

#### OCCASIONAL INJURIOUS RESULTS OF EXTRACTION.

93. Extraction of the teeth is occasionally attended with one or two unfavorable results. The most common of these is the splintering of the alveolar process, which in general occurs in every instance of the removal of the molares of the under jaw with the tooth-key, and almost always during the extraction of the corresponding upper teeth, with whatever instrument the operation is performed. The diverging form of the roots of these last teeth renders it impossible that they can ever be withdrawn without a considerable yielding of the sockets, which is generally attended either by a partial splintering of the outer side of the alveolar process, or the fracture of a small portion of it, which is usually brought away adhering to the tooth. No injurious effects will follow these occurrences, if the piece of bone that has been detached does not form a portion of the sockets of the adjoining teeth, which would thus be deprived of part of their support. On the contrary, the removal of a small portion of the bone is rather beneficial than otherwise, as the wound will then close up sooner than it would if the sharp edge of the socket had been left to be removed by the absorbents. The practitioner, however, should take care neither to leave the loose splinter in the wound, where it might endanger the occurrence of suppuration, nor to parade it before the eyes of his patient, if he does not desire to have the unmerited credit of "breaking the jaw bone."

94. Far more serious and extensive splinters of the inner plate of the inferior maxillary bone have been frequently occasioned by the improper application of the fulcrum of the key to the inner side of the tooth. But I need not caution the scientific operator against them, as they can never occur excepting in the instance of the malpractice that has been mentioned.

95. Complete fracture of the lower jaw, or partial dislocation of it, have been enumerated by some authors, as amongst the occasional consequences of extraction; but such serious accidents can never happen except in those cases where the most revolting violence has been used. The operator should, however, in every instance guard against them, by supporting the jaw with one hand while he applies the instrument with the other.

96. Considerable annoyance is frequently occasioned by the

bleeding which follows the extraction of the teeth, in persons who are of a sanguineous temperament, or of a relaxed vascular system. Many cases are known, in which the hæmorrhage has been profuse; and one or two are on record, in which it led to a fatal termination, after the carotid artery had in vain been tied. In these instances, it may well be supposed that every other means had been tried, before recourse was had to such a serious operation, as that of placing a ligature on this important vessel. But in almost every case, the hæmorrhage may be restrained by introducing the extremity of a small roll of lint into the bottom of the cavity, and successively inserting and pressing down the rest of it, until the socket is filled. If this does not suffice, the power of the compress may be still farther increased, by filling up the space with a piece of cork or of ivory, which is to be left so prominent, that the opposite teeth may press upon it, when the jaws are brought together by a bandage.

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## CHAPTER V.

### ON EXCISION AND TRANSPLANTING OF THE TEETH, AND THE IMPROPRIETY OF BOTH OPERATIONS.

BEFORE concluding the description of the operations on the teeth, it may be well to notice two, which were formerly practised to a considerable extent, although they are now nearly, if not altogether, obsolete.

#### "EXCISION" OF THE TEETH.

The operation of excision was introduced into this country, I believe, by an American practitioner, who proposed curing tooth-ache, by cutting across the irritated tooth, and getting rid of the nerve, either by drawing it out from the canal, or if this could not be effected, by destroying it with the actual cautery, or by means of caustic. The operation succeeded in some instances, but failed in the greater majority; as it generally happened that, when the tooth was cut across, the nerve was at the same time divided, and usually shrunk so far into the canal, that it was impossible to remove it. When this occurred, it was equally beyond the reach of the actual cautery, as the smallness of the canal either prevents the cauterizing iron from entering; or if it admits it, the temperature of the instrument is so diminished before it can be introduced, that it is inadequate to effect the destruction of the nerve on coming in contact with it. The use of the potential cautery is quite as objectionable; for, although the caustic is ultimately more certain in its effects, it is invariably productive of

much pain at the moment of application, and often gives rise to a greater degree of irritation, than that which was occasioned by the disease in the tooth.

The practice of excision is now therefore deservedly abandoned, (unless indeed the operation preparatory to pivoting the front teeth falls under the denomination,) as even in those few instances in which it succeeded, the dead roots often afterwards became a source of irritation in the mouth, and had eventually to be extracted.

But in the great majority of cases, the operation was a decided failure, and generally gave rise to threefold pain; as, for example, in the instance of a large grinder of the upper jaw when three or four different branches of the nerve are laid bare by the excision, instead of the one which had been exposed by the progress of the caries. In many cases the suffering was most acute, and, I believe, one or two are known in which the operation led to a fatal result.

#### ON "TRANSPLANTING" TEETH.

This operation, the most revolting and unjustifiable of all that have ever been performed on the teeth, or any other part of the body, is now completely exploded from the practice of the modern dentist. But as it was suggested by John Hunter, who has devoted a considerable part of his work to the subject, it will be necessary to notice it, or to pass his details in review. The arguments which Hunter uses in its commendation, and the directions he gives for performing the operation, are so absurd and inconsistent, that were it not well known to have been a favorite practice of his, posterity might well believe that this part of his work was surreptitious.

He commences by mentioning the circumstances favorable to the operation. "Much," he says, "depends upon the patient; he should apply early, and give the dentist all the time he thinks necessary to get a sufficient number of teeth that appear to be of a proper size." In other words, to collect a band of unfortunate wretches for maltreatment.

The teeth best adapted for the operation, are mentioned next. The incisors and canines, he says, are most so; the small grinders not so favorable for the purpose, and "It is hardly possible to transplant the large grinders, as the chance of fitting the sockets of them is very small." A strange way of obviating this difficulty is, however, suggested, for he adds, "When indeed a grinder is extracted, and the socket is sound and perfect, the dentist may perhaps be able to fill it with a *dead* tooth."

It is surprising, indeed, that such an idea should ever have

emanated from so profound a physiologist as Hunter ; and proves how much a man's better judgment may occasionally be biassed, when in the pursuit of a favorite object.

The merits of the "scion" tooth, by which he means the one taken from the hapless victim, are next discussed. He observes, "It should be a full grown young tooth, because the principle of life and union is much stronger in such, than in old teeth." He moreover recommends, that the "scion tooth should be that of a female, for female teeth are in general smaller than those of men."

The next difficulty to be surmounted, was to find a tooth that would accurately fill the socket into which it was to be transplanted. Hunter observes, "When the fang of the scion tooth is larger than that which it is intended to supply, it must be made smaller, but only in that part where it exceeds. But the necessity of this should be avoided if possible ; for a tooth that is filed has lost all those inequalities which allow it to be held much faster. If, however, some part of the tooth must be removed, it should be done so as to imitate the old tooth as much as possible."

He adds, "But the remedy is to *have several people ready*, whose teeth, in appearance, are fit ; for if the first will not answer, the second may."

So attached was Hunter (and, I believe, the greater number of his contemporaries) to this unscientific operation, that, even if, in the number of the unfortunate individuals thus selected for abuse, a tooth of the requisite form was not to be found, he still suggests the propriety of transplanting, and recommends "a dead tooth to be taken by the dentist, and filed down to fit the socket in which it is to be placed, and afterwards fastened to the other teeth, with the silk, or sea-weed. The patient," he observes, "must now finish the rest. He must be particularly attentive at first, and give it as little motion as possible, and must take care not to catch cold, or expose himself to any of the other common causes of fever."

It is unnecessary to enter into farther detail of a practice so unjustifiable and absurd, that it must always remain a matter of surprise that John Hunter ever countenanced it. He himself, indeed, admits that "this operation, like all others, is not attended with certain success. It sometimes happens that the parts do not unite ; and in such cases, it often acts as an extraneous body ; and instead of fastening, the tooth becomes looser and looser ; the gum swells, and a considerable inflammation is kept up, often terminating in gumboils. In some cases also, where it is not attended with success, these symptoms do not exist. The parts appear pretty sound ; only the teeth do not fasten, and sometimes drop out."

In conclusion, I would observe, that no one would now be jus-

tified in reviving this operation for the purpose of experiment ; and still less, from more improper and interested motives ; as, besides the cruelty of it to the unfortunate class of beings from whom the teeth were generally taken, it frequently led to the introduction of deplorable infectious diseases into the constitution ; and is, to say the least of it, a practice unscientific in its nature, and unfortunate in its result.

## PART IV.

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### ON ARTIFICIAL TEETH.

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#### CHAPTER I.

*General Observations on Artificial Teeth—Various kinds of them—Their Respective Advantages—Disadvantages of “Mineral,” or Porcelain Teeth—Means of Preserving Artificial Teeth.*

THE construction of artificial teeth is an invention of considerable antiquity, and is supposed to have been known to the Romans upwards of two thousand years ago.\* It would be vain, however, to attempt to describe the condition of the art during that early era; and still more so, to mention its progressive advances to its present state of comparative perfection. The improvement of it, indeed, has not been in proportion to the number of its years; and in this country, until within the last half century, this important branch of the dentist's duty, if not the profession itself, had but little claim to be considered as a respectable subdivision of medical science.

Artificial teeth are formed, either from the large tusks of the southern sea horse, or of natural teeth, which may be fixed either upon sockets of this hard species of ivory, or on gold plates, accurately adapted to the space to which they are to be applied.

\* All the commentators, from Aristotle downwards, have been puzzled by the teeth of Marcus Furius Dentatus, the Roman consul. According to some of them, the patrician received his cognomen from the circumstance of his teeth being of that elegant order, which is vulgarly known by the term “buck;” while others maintain that he had but one tooth, which, however, was of wonderful magnitude, and occupied the whole range of the mouth. Possibly it may facilitate the inquiry, if it is suggested, for the benefit of these naturalists, that it might have been only an ill-made set of artificial teeth, such as formerly may have been suspended, *in alto relievato*, before the door of some indifferent practitioner in ancient Rome, as they now are, in defiance of delicacy, in modern cities.

Natural teeth may also be attached by means of gold pivots to the roots which remain in the mouth after the bodies of the teeth have been destroyed by caries, or broken over by an accidental blow. This is by far the most imperceptible of any of the modes of fixing artificial teeth; and, when properly done, a tooth kept up in this way, will often bear a minute examination by an experienced dentist, without being discovered, and may be used with as much freedom by the patient as any of the adjoining natural teeth. The operation, however, is limited to the six or perhaps the eight front teeth of the upper jaw.

Artificial teeth have also of late years been made from a porcelainous substance, and under the name of "mineral" and "terro-metallic" teeth, have afforded an extensive range for empirical deception. The attraction held out is their alleged "incorruptibility," by which term the unwary are entrapped, and lead to believe that teeth of this description are much more durable than the natural ones. The very reverse of this is the case; for although they are not subject to change of color, from their vitreous substance being impervious to the saliva, yet they are in every instance so brittle, as to be easily broken off, on coming in contact with those of the opposite jaw; and in the rare cases in which they do not thus give way, the natural teeth to which they are opposed, are generally seriously injured by the friction of the silicious body, which never, under any circumstances, feels congenial to them.

When these mineral or china teeth were first introduced into this country from France, (for it is to our neighbors on the opposite side of the Channel that we owe these, as well as many other similar, ephemeral productions,) the greatest mystery was affected on the subject of their composition, although any of our potters or porcelain makers could easily have disclosed it, as it is in every respect analogous to the ware which they fabricate. The most extravagant expectations were then formed from them; although few or rather none of the advantages which they were supposed to possess, have been realized, and they are now considered to be a complete failure. They have never been much used by any of the leading dentists of the day, and I believe are now wholly discountenanced by the respectable part of the profession, although they still reign paramount with the disreputable.

Natural teeth fixed upon a plate of gold are next to the pivot in point of appearance, and when accurately fitted, may always be worn by the patient with the greatest comfort. This mode of attaching artificial teeth is also more generally in use than any of the others, as nothing can be easier than to make an indifferent plate and "rivet" teeth upon it, although none but an expert dentist can form a good one.



If properly made, a gold plate ought to fit accurately into all the undulations of that part of the gum which it covers, having concavities to correspond to the prominent points of the membrane, and convexities to enter into its depressions. It should also closely surround the teeth behind which it passes, but without exerting undue pressure upon them.

It is to be retained in its position by broad springs, or plates of gold, attached to the posterior surfaces of the remaining teeth, and occasionally embracing the fronts of them, or altogether surrounding them, especially those in the back part of the jaw. Great benefit, indeed, will sometimes be derived by extending the plate over the whole surface of one or more of the posterior teeth in the form of a "cap." The pressure of the piece is thus chiefly directed against the crowns of the teeth, and its effect upon the gums is either much diminished or altogether removed. Neither of these modes of attaching the plate will occasion injury to the natural teeth if the springs or caps have been properly applied to them; and I have no hesitation in adding, that the gross misstatements which empirics are constantly publishing upon this subject, are generally the result of their own malpractices.

The natural teeth, with which the deficiency is to be filled up, are to be attached to the plate, not by the common but imperfect practice of "riveting," and thus leaving the heads of the nails either to irritate the gums or prevent the accurate adaptation of the plate to the surface, but are to be fixed by means of gold pivots soldered upon the plate, and forming an integral part of it. When a plate is thus constructed, the surface of it which is in contact with the gum will afford no indication of the manner in which the teeth have been attached, and will fit so accurately at every point, as to form a complete vacuum, preventing the entrance of adventitious matter beneath it, and, by its equal adaptation to the surface, will greatly diminish the unpleasant pressure which is generally at first experienced from all artificial teeth.

The gold plate is required in all those cases in which roots of teeth remain in the mouth, and will not admit of being pivoted, or when the absorption of the alveolar processes has not occurred to the usual extent, and the opposite teeth either strike upon the gum, or high upon the posterior surfaces of their antagonists.

There are many instances, however, in which it becomes necessary to form artificial sockets; when absorption of the natural ones has taken place to the degree which it usually does, when the teeth have been lost from this cause. In such cases, the sea horse bone is invaluable, as not only artificial teeth, but a very good representation of the external appearance of the natural sockets and gums, may be formed of it; and the effect may be still farther heightened by staining the ivory to resemble the natural hue of the gum.

The same principles are to be observed in the construction of artificial sockets of bone, which I have already mentioned in my remarks upon gold plates. The socket must accurately fit every point of the surface which it covers, and form a vacuum so perfect, that it will exclude not only the particles of alimentary substances, but even the air itself, from entering between it and the gum. The piece will then often be retained in its place solely by that pressure which the atmosphere exerts upon all solid bodies. The principle by which the artificial piece is thus fixed in the mouth, is commonly termed "suction." The expression, however, is erroneous, as in reality no such power as suction exists. But when two solid substances are brought together, and the air withdrawn from between them, they will adhere to each other, in consequence of the pressure of the air upon their surfaces.

The artificial teeth may be formed either out of the bone of the socket, or of the enamel with which this species of ivory is surrounded; or natural teeth may be adapted to it, and attached by a gold or silver screw—the old plan of riveting being in this case as inapplicable as it is in the instance of the gold plate. The natural teeth are infinitely preferable to either of the others, both of which are more or less objectionable; those that are carved out of the bone rapidly losing their color on exposure to the influence of the saliva; and the enamel, from the difficulty of procuring it of the exact form which is required for the natural curve of the jaw, and also on account of the peculiar pale blue color which it almost invariably acquires in the mouth.

Natural teeth are indeed in every respect superior to all others that either have been, or ever will be, discovered; for it is beyond the power of the most accomplished artist to form an artificial tooth which will have the same appearance as a natural one, or to invest any foreign body with the peculiar attributes of the human teeth, and the congenial feeling which they have in the mouth. And yet, prejudice has long been prevalent against them, although it is now rapidly subsiding, notwithstanding all the attempts of interested persons to foster it. But a moment's reflection will convince the most sensitive, that natural teeth, at the time they are used for this purpose, are as completely disorganized and free from taint, as it is possible for any substance whatever to be.

All of these artificial teeth are subject to that decomposition which every inorganic substance undergoes in the mouth. The hardest ivory will, in the course of time, be reduced to the consistence of cartilage, and the most perfect natural teeth will yield to decay, when placed in this situation. Artificial teeth, however, will generally remain for three years in a state of tolerable preservation. In many cases they may continue much longer,

although, on the other hand, I have known numerous instances in which they have been completely destroyed by the action of the saliva, in so short a period as from six to twelve months.

Much depends upon the attention of the patient, as artificial teeth, like the natural ones, are materially preserved by keeping them in a state of purity. The use of a brush and water, with any of the finer soaps, and a little levigated chalk or finely pulverized pumice-stone, will be sufficient for this purpose, and the unpleasant taint, which they are apt to acquire, may be removed by the addition of a little camphor.

The following formula, which has been mentioned to me by a distinguished patient, will be found to be remarkably good :—

|   |                                                                                                                    |   |              |
|---|--------------------------------------------------------------------------------------------------------------------|---|--------------|
| R | Levigated chalk,<br>Pumice-stone, pulverized,<br>Camphor,<br>Finest soap,<br>Water, as much as shall be necessary. | } | Equal parts. |
|---|--------------------------------------------------------------------------------------------------------------------|---|--------------|

To be formed into a paste, which is to be placed on the teeth at night, and brushed off with water in the morning.

## CHAPTER II.

### ON THE CONSTRUCTION OF ARTIFICIAL TEETH.

*Of Models, &c.—Of Pivoting—Of Gold Plates—Of Artificial Sockets, with Natural Teeth—Of Staining the Bone—Of Screwing Teeth—Of Spiral Springs, &c.*

97. THE first part of the process consists in taking an accurate impression in wax of the part where the deficiency exists. The wax used for this purpose should be of the purest description, and whitened by exposure to moisture and the rays of the sun, instead of by the ordinary bleaching process, by means of muriatic acid and chlorine, which always impair its ductility, and render it brittle, although the same effect is often produced by adulteration.

98. The wax is to be softened by exposing it to the heat of a common fire, and reduced to an equal consistence, by manipulation, before applying it to the mouth. An accurate impression is then to be taken of the part where the deficiency is, and of the adjoining teeth, to which the artificial ones are to be attached. If only a few of the natural teeth are lost, it will not be necessary to extend the wax beyond two or three of the teeth adjoining the

space ; but if the whole, or greater number, of the set, are wanting, the model must extend over the whole surface of the jaw.

99. It is of the utmost importance that the impression which is taken of the mouth should be minutely correct, as the success of every subsequent part of the work almost wholly depends upon the accuracy of the model. The operation of taking the impression will be much facilitated by retaining the wax within a silver scoop adapted to the form of the jaw. By means of this the wax is not only more accurately applied to the gum, but it is also prevented from being compressed while withdrawing it from the mouth.

100. The impression thus obtained is to be carefully filled with a mixture of plaster of Paris and water. The paste thus formed in a short time becomes hard ; when it is so, the wax is to be removed by again softening it before the fire, and gradually withdrawing it. Care must be taken that the teeth of the model are not broken during the removal of the wax, although the chance of the occurrence of this accident will be greatly diminished by having previously inserted small brass pins into the cavities in the wax which represented the teeth.

101. This plaster of Paris cast will exhibit an exact model of the parts, if the impression has been accurately taken ; and it is to be prepared for future operations, by first expelling the superfluous water by the heat of the fire, and afterwards placing it for a few minutes in a mixture of equal parts of wax and resin. When the model has thus been hardened, the process of adapting the artificial teeth to it is to be commenced.

#### OF PIVOTING TEETH.

102. The pivot, which consists in grafting the body of another tooth upon a root remaining in the mouth, is by far the most effectual mode of attaching artificial teeth, and when properly applied, it is difficult for the most accurate observer to discover those that have been fixed in this manner, from any of the adjoining natural ones.

103. The operation, it has already been stated, can only be performed on the incisors, canines, and bicuspidates of the upper jaw, but, in general, ought not to be extended beyond the six front teeth, as the small grinders, from the peculiar shape of their canals, do not so readily admit of its successful application ; and the teeth in this part of the jaw are so much used in masticating, that a pivoted tooth here is generally productive of more inconvenience than utility.

104. The first part of the operation consists in preparing the root for the reception of the tooth which is to be attached to it. If any part of the body of the tooth remain, it may be cut across,

either with a small saw, or by a pair of cutting forceps, and the rest of it filed down to a level with the gum. The surface should be made as flat as possible, and the file that is used should be either of a round or half round form; the sides of the root will thus be left more prominent than the centre, which will prevent the pivoted tooth turning round on its axis, and greatly improve its appearance.

105. The canal in the root is next to be opened up to the requisite size, by means of small broaches, or the cautious use of the drill. This is generally the most painful part of the operation, and must be performed with the utmost caution. Great care must be taken that the instrument is not broken in the root, by the starting of the patient; for this is an accident of the most serious nature, which can only be remedied by the extraction of the root, if the broken piece of the instrument cannot be withdrawn.

106. In selecting a tooth to fill up the deficiency, the operator should choose one that resembles the original tooth, not only in shape and general appearance, but also as nearly as possible in the diameter of its root. The reason of this is obvious; for if the diameter of the neck of the tooth, which is to be used, be less, from its anterior to its posterior surface, than that of the root remaining in the mouth, the pivoted tooth will be proportionally within the line of the other teeth, and the edge of the root will project beyond the surface of the pivot. On the other hand, if the diameter of the tooth be greater than that of the root, the reverse will take place, and the pivoted tooth will project beyond the root; which it is equally desirable to avoid, although the imperfection of the operation is not so conspicuous as in the former instance.

107. The root having been duly prepared, and, if necessary, a model of it taken, the tooth which is to be pivoted is to be accurately fitted to the model, by means of the rose-pink and water color, and afterwards, in a similar manner, to the root.

108. The next step consists in making an opening into the pivot, corresponding to that in the root. This is the most important part of the whole operation; for unless the centre has been taken with geometrical precision, the pivoted tooth will afford neither comfort nor satisfaction to the patient.

109. There are two different ways of finding the centre of the tooth, both of which may answer equally well, although the one which I shall first mention is the preferable. It consists in fitting into the canal a small pin of birch, which is to be cut across with a pair of small dividing forceps, a very little below the surface of the root. The projecting extremity of the wood is to be colored with the rose-pink pigment; and the tooth being carefully applied to the space, a small speck of color will be left upon it, which will indicate the centre of the root.

The same result is attained by the other mode, in a somewhat different manner. The body of the tooth is, in this instance, to be covered with a thin layer of wax, and on being placed in contact with the root, a small prominence will be left on the wax, corresponding to the opening in the root.

110. At the point thus marked, a hole is to be drilled into the body of the tooth, and a piece of gold wire corresponding to the size of the opening in the root, attached to it by means of a screw. The gold pivot may be still more securely fixed by a small cross pin, extending from one side of the tooth to the other, through the centre of the wire.

111. The pivot is now to be accurately adapted to the direction of the opening in the root, and surrounded with a small quantity of soft silk thread. This diminishes any irritation which the presence of the gold might occasion, and firmly retains the tooth in its position.

112. A slight degree of pain is very frequently experienced in the root for a short time after the tooth has been pivoted. The irritation almost invariably subsides in the course of a few days; and I have never in any instance found the symptoms exceed those of a smart attack of toothache.

Cases, however, have been mentioned, in which the irritation has been far more severe; but I conceive that it has always been occasioned by the improper performance of the operation. If the pain continue beyond the period I have mentioned, it may be suspected either that part of the nerve remains, or that the gold pivot projects beyond the extremity of the root into the alveolar process.

#### OF GOLD PLATES.

113. The gold plate, with natural teeth attached to it, is inferior only to the pivot in point of appearance, and the smallness of the space which it occupies in the mouth. When properly constructed, it is nearly as imperceptible a mode of fixing artificial teeth.

114. The plate becomes indispensable in all those cases in which a considerable number of the roots remain in the mouth; or when these have been lost, and absorption of the sockets has not proceeded to the usual extent; or when the under teeth strike high up, on the gum or on the posterior surface of the upper ones.

115. The application of the plate is chiefly confined to the upper jaw. In the under jaw, the employment of it is not so advantageous, although it sometimes becomes necessary to use it here; especially in those instances in which the whole of the upper teeth, and only a few of the under, have been lost, and when spiral springs are required to retain the artificial upper set in its position.

116. For the construction of a gold plate, it will be necessary to make a cast of the model in bell metal or the hardest brass. Upon this cast a reverse is to be made by surrounding the sides of it with soft pipe-clay, and pouring liquid pewter on the surface. If the plate is to be large, and difficult to strike up, it will be advantageous to have two of these reverses,—one of them considerably smaller than the other.

117. Between this reverse and the cast, the plate is to be struck up. If the case be difficult, it will greatly facilitate the operation to anneal the gold repeatedly during the process. The ductility of the metal is thus increased, and the danger of its splintering diminished. By attention to this, and the employment of gold of the proper quality, there will rarely be found much difficulty in striking up a plate to the most unequal surface.

118. The gold used for this purpose ought never to be of a lower standard than twenty carats. If it be finer than this, the plate will not possess the requisite degree of hardness; and when of inferior quality, it is not only difficult to strike up, but will occasion a disagreeable taste in the mouth.

119. When the plate has been struck up, it will in general be well to try it in the mouth before attaching to it the springs by which it is to be retained in its place; and if it apply closely to the teeth, it will be necessary to file away a part of the gold corresponding to the thickness of the metal which is to be used for the spring.

120. In attaching the springs, it ought always to be an object to make them as broad as possible, and to apply them to the posterior teeth. The injury which a narrow spring so often produces on the tooth which it surrounds, is thus not only prevented, but the external appearance of the gold is also concealed.

121. It is frequently highly advantageous to carry the springs over the whole surface of one or more of the posterior teeth in the form of a cap, instead of merely surrounding their sides and anterior and posterior surfaces. This not only retains the piece more firmly in its place, but prevents any annoyance being occasioned by the pressure of it upon the gum, and is almost always required when it becomes necessary to apply the plate to the under jaw, as in those instances where but a few of the teeth there have been lost, although the whole of those in the upper may have been so; when a plate must be put in the lower jaw to afford attachment to the spiral springs by which the upper artificial set is to be retained in its place.

122. The same mechanism becomes necessary in those cases in which the whole of the upper teeth have been lost, while the under are in a state of perfect preservation. Such an occurrence is occasionally met with; and I have known several instances in

which eminent practitioners had declined to make any farther effort, after the patient had in vain attempted to keep up the artificial upper set by what is generally but erroneously termed suction. No difficulty, however, was found in fixing the piece by means of a pair of spiral springs, which were attached below to caps enveloping the molares and adjoining bicuspides.

123. The plate having been duly fitted to the mouth, the next part of the process consists in adapting the natural teeth to the surface of it. I have already mentioned that these are to be attached, not by the common and unscientific practice of riveting, but by means of pivots soldered to the plate. This more recent mode of fixing the teeth is one of the greatest improvements which have ever been made upon the gold plate, and contributes in the highest degree, not only to its appearance and durability, but also to the accuracy of its adaptation to the gums or any roots that remain, and the ease with which it will be worn by the patient.

124. In attaching these pivots to the plate, nearly as much mathematical precision will be required, as in the instance of finding the centre of the tooth in cases of pivoting. The mode of proceeding is, first to fit all the natural teeth to the plate, by means of the rose-pink and water color; leaving them of considerably greater length than they will ultimately be. An opening is then to be drilled in the centre of the tooth, and on applying it to the plate, and slightly striking it with a small instrument, a portion of the comminuted bone will be left on the surface, and indicate the point on which the pivot is to be placed.

125. When the pivot has been soldered on, the tooth is to be fitted to the plate, until it is shortened to the extent required. The adaptation of the adjoining one is to be proceeded with in a similar manner; and thus with the remainder of the teeth successively, until the whole of them have been accurately adapted.

126. While fitting on the teeth, the gold must be filed away to allow them to project in front of the plate; so that on being applied to the mouth, they may be in close contact with the surface of the gum or roots, and no appearance of the metal indicated. The teeth should advance in front of the plate, by little more than the thickness of the enamel, and no more of the osseous part of the tooth should project than is necessary to give support to the vitreous substance.

127. The plate is now to be cleaned, either by throwing it while warm into muriatic acid, or by boiling it in diluted sulphuric, and after hardening the springs by means of a hammer and a small anvil, the surface should be polished with pulverized pumice-stone, crocus, and oil, and afterwards with rouge and water.

128. The teeth are fixed upon the plate, by the simple process of wrapping a little soft silk around the pivots, and moistening it



with spirit varnish. It will be well also to cover with the varnish the surface of the tooth which is in contact with the gold ; as the saliva is thus for some time prevented from acting on the osseous substance.

#### OF ARTIFICIAL SOCKETS.

129. Artificial sockets are constructed with a more extended object than either the pivot or the gold plate. When the latter are used, it is in general merely requisite to fill up the space which the bodies of the natural teeth had occupied ; but when the socket is required, it is necessary to form an artificial substitute not only for the teeth, but also for the alveolar processes which have been removed by absorption.

130. They are also formed by a more gradual and laborious process than either of the others. Thus although a pivot may perhaps at once, and by the eye alone, be adapted with considerable accuracy to the root, and a plate may, by a single stroke of the hammer, be extended over a large portion of the cast, yet in making an artificial socket, the bone must be gradually cut away, and equally applied to the surface of the model, otherwise it will never fit with accuracy, or be worn with comfort.

131. Artificial sockets are usually formed out of the tusks of the hippopotamus or southern sea horse. Those of the elephant, and north sea horse or walrus, are also sometimes used for this purpose ; but they are much inferior to the former, as the ivory soon loses its color, on exposure to the action of the saliva ; and the walrus bone is often of an oily texture, and more apt to acquire a disagreeable taint, and occasion an unpleasant taste in the mouth. The sea horse horn is also greatly superior to them in hardness, and in the whiteness of its color, and power of retaining it ; and especially on account of a considerable part of its surface being surrounded by an extremely hard enamel, of which the others are altogether destitute. The artificial teeth may often with much advantage be formed out of this enamel, when there exists any prejudice against natural teeth on the part of the patient.

132. There are two different ways of cutting up the sea horse horn into the blocks from which the artificial sockets are to be made. If the teeth are to be formed out of the enamel, the tusk is to be merely transversely divided, and as much of it cut over as is necessary for the thickness of the socket : the fibres of the bone are thus perpendicularly applied to the surface of the model.

133. But if natural teeth are to be attached to the socket, or if artificial ones are to be carved out of the plain bone, it will be better to apply the fibres of the bone horizontally to the model,

as the enamel will thus be retained on the grinding surfaces of the artificial teeth. A transverse section of the tooth is in this instance to be made, the length of which should correspond to the breadth of the piece, and the block is to be formed out of this, by again slitting it up in a horizontal direction.

134. The block is to be horizontally applied to the model, the surface of which being colored with rose-pink and oil, a portion of this will adhere to the bone at the points of apposition, and thus indicate the part which requires to be removed. These colored marks, and especially those that are white in the centre, are to be cut away until the socket has been excavated to the requisite extent, and the bone is in close and equal contact with every point of the surface which it covers.

135. The piece is now to be reduced nearly to the size and shape which it will ultimately be: but it will be well to leave it large in every direction, until it has been tried in the mouth, as it will often require to be removed to a greater extent in one part than in another. As a general rule, it may be observed that pieces for the upper jaw should be left more prominent on their lower edge than at that which is in contact with the gum, while those for the under jaw generally require to be reduced in the opposite direction.

136. The block is now ready for being fitted to the mouth. This is often a much more difficult part of the operation than the adaptation to the model, and will rarely be successfully accomplished, unless by the individual who either has formed the socket, or is possessed of sufficient manual dexterity to have been able to do so. On the other hand, a mere mechanical artist, however well he may have fitted the socket to the model, will seldom adapt it adequately to the mouth. But to perform this important part of the operation with success, the dentist must combine a considerable degree of manual ability with an accurate knowledge of the anatomical structure of the mouth.

137. In adapting the piece to the mouth, the same course is to be followed as in fitting it to the model. If the socket do not accurately apply to the surface, the rose-pink and water color must be used to indicate the points of contact, and these are to be carefully cut away until the piece is brought into close apposition with the parts over which it is to extend. In the same way it is to be adapted to the teeth, whether natural or artificial, in the opposite jaw.—It may here be remarked, that the practitioner will do well to recollect, that however accurately the artificial piece may fit to the surface, it will never remain steady in its place, nor be worn with ease by the patient, unless allowance is made for the free motion of the frænum of the lip in the upper jaw, and of the tongue and sublingual gland in the lower.

138. The piece having been adequately adapted to the mouth, and a small line marked upon it corresponding to the centre of the jaw, the next part of the work consists in forming artificial teeth upon it; or if natural teeth are to be used, in fitting them to the socket.

139. If artificial teeth are to be formed, they are to be first marked off with the file upon the surface of the bone, and the requisite shape afterwards imparted to them by means of engraving instruments. It is usually necessary, at the same time, to form a representation of the appearance of the gum and anterior surfaces of the alveolar processes.

140. The posterior, or palatal and lingual, part of the piece should be hollowed as far as practicable, and may be left uncarved, as it is not necessary here to form a representation of the natural teeth, for the object of appearance, and the plane surface will in general be more agreeable to the tongue.

141. The grinding surface of the artificial teeth should be carved to resemble that of the natural set, unless the enamel has been retained on the bone, when it is merely to be diagonally or crucially notched with the file. But this part of the work may always with advantage be postponed until the piece has been stained.

142. When the artificial teeth are formed out of the enamel of the sea horse bone, they are to be carved in a similar way; but almost the whole of the work must, in this instance, be done with the file, as the hardness of the enamel renders it impervious to any other instrument.

143. When natural teeth are to be attached to the artificial socket, they are first to be polished, if it be required, by means of pumice-stone and water; and afterwards to be cut across at the neck, and filed into a semi-elliptical form. It is usually necessary to file them in an oblique direction, making the posterior surface of the tooth considerably shorter than the anterior, especially if the socket be thin. In thus preparing the teeth, it is highly necessary to make their fitting surface perfectly plane.

144. In adapting the teeth to the socket, no instrument but the file should be used, as the surfaces can by no other means be made so equal, or their apposition rendered so complete.

145. The fitting surface of the tooth having been colored with the rose-pink and water, and applied to the socket, the indicated points of contact are to be removed by a round, or half round file. The tooth is thus to be gradually let down to its place, and temporarily fixed with a little wax and resin. The rest of the teeth are to be fitted in a similar manner; the centre teeth being always let down first, and the adaptation of one tooth completed before commencing with another.

146. It is not necessary to place more than six, or, at the utmost, eight, natural teeth upon any artificial socket, as no part of the set posterior to the first small grinder is seen in the ordinary aspect of the mouth. The posterior part of the socket is therefore either to be carved in representation of the natural teeth in this situation; or it may, with more advantage, be left altogether plain; as, when in this condition, it not only presents less impediment to the motions of the tongue and cheeks, but greatly contributes to the preservation of the piece.

147. When spiral springs are to be used, the sides of the artificial set must be made quite plain, to allow the springs to move without restraint. The spaces on which the springs are to move should be somewhat sunk beneath the line of the adjoining surface, which prevents any annoyance being occasioned to the cheeks by the prominence of the springs, or of the pivots by which they are fixed, and also assists in keeping the former in their proper position. The form of these spaces must be familiar to every practitioner. It would be vain, however, to attempt a verbal description of them, which I the more regret, as they are generally very inadequately constructed.

148. When the necessary form has been given to the artificial piece, the surface of it is to be rendered smooth by means of the file, and afterwards of the scraper, used in the same direction: in the application of both of these instruments, it should be the study of the artist to follow, as far as practicable, the course of the fibres of the bone. The whole of the piece is afterwards to be polished by the successive application of fine sand-paper, pulverized pumice-stone, and levigated chalk, with water.

#### OF STAINING THE SOCKET.

149. The next part of the process consists in imparting to the socket a color resembling the natural hue of the gums. There are various means of staining the bone, all of which may answer the purpose equally well, although I prefer using cochineal, sanderswood, and diluted acetic acid, or the purest vinegar, in the proportion of three grains of the former, one drachm of the second, and half a pint of the third: the proportions, however, may require to be varied, as the dyes are not always of the same quality.

150. The staining liquid is to be heated in a vessel formed either of pewter or of earthenware; and when it has attained the boiling temperature, the piece is to be immersed into it, and allowed to remain between one and two minutes, and afterwards plunged into warm water. All those parts of the bone, which are not intended to be colored, should have been previously covered with spirit varnish, which will prevent the dye affecting their surface.

151. The varnish, and whatever specks of the coloring matter may have adhered to the artificial teeth, may be easily removed by the scraper. The edges and crowns of the teeth are then to be formed, and their bodies polished in the way already mentioned.

152. If natural teeth have been fitted to the socket, they are now to be attached to it. This is generally done by means of the screw and rivet, but the practice is exceedingly inadequate, as the teeth are always imperfectly fixed in this way; and there are many cases in which, from the inequalities of the surface of the socket, the rivet cannot be properly made. The heads of the nails are also apt to occasion annoyance to the gum, and the part of the bone immediately under the rivet is generally so injured by the hammering and compression, that it soon gives way, and the teeth become loose.

#### OF SCREWING TEETH.

153. The mode of attaching the teeth by means of a screw, which extends through the socket and body of the tooth, is in every respect infinitely preferable. The teeth are thus far more firmly fixed, as every turn which the screw makes in the socket is equal to a rivet; and, as the heads of the screws can always, in this instance, be cut away to a level with the surface of the bone, they will neither disturb the fitting of the piece nor irritate the gum. The practice of screwing is, however, much more difficult than that of riveting, and cannot be safely and successfully adopted excepting by an experienced artist.

154. The first part of the operation consists in drilling a hole in the body of the tooth, after it has been accurately fitted to the socket by means of rose-pink and water color. This opening should extend as far down as the enamel, and be made in the direction of the axis of the tooth; the point of the drill, however, being directed towards the posterior part of the tooth; and thus leaving, at the bottom of the opening, a small portion of the bone to support the enamel on the anterior surface, which will prevent it being discolored by the contiguity of the screw.

155. The corresponding opening in the socket must be drilled with the nicest precision. The point at which it is to be made will be indicated by placing the tooth accurately in its position, and slightly striking it with a small hammer, when a little of the bone dust will be left on that part of the socket which corresponds to the opening of the tooth. When the socket has been perforated, it will be necessary to extend the drill through it into the tooth, that the line of the openings in both of them may be made uniformly straight.

156. A screw is now to be made through the socket by means of the tapping instrument, moistened with water; and the tooth having been applied to its place, the tap is to be advanced a turn or two, until it has made a short screw in the tooth, corresponding to the course of that in the socket. The instrument is then to be withdrawn, and the tooth tapped, by itself, in the direction indicated.

157. It is of the utmost importance that the course of the screw, in the socket and in the tooth, should be completely in unison. This, indeed, forms the chief difficulty in the practice of screwing, and is the only secret in the art; for unless it is attended to, the tooth can never be adequately fixed.

158. A gold screw of the requisite size having been prepared, is to be inserted into the socket, and advanced through it and the tooth, until it has attained the extremity of the opening. Great care must be taken to push it no farther, lest it lead to the splintering of the tooth, or the overhauling of its screw. It requires a considerable degree of delicacy of touch in the fingers to ascertain when the screw is, in the technical language, "home;" and this can only be acquired by experience.

#### OF SPIRAL SPRINGS, &c.

159. Artificial sockets are frequently retained in their position by the accuracy of their adaptation, and the pressure which the atmosphere exerts upon all solid bodies. In the under jaw the gravitation of the piece also assists in keeping it in its place, and small sockets may generally be adequately fixed by this means alone, if they have been accurately fitted. In the upper jaw the weight of the artificial teeth has, of course, a counteracting tendency; and it is almost always necessary here to attach small pieces to the adjoining natural teeth, either by means of a ligature, or by a small piece of gold wire, adapted to the neck of the tooth, and termed a "spring." But it should be kept in recollection, that these springs are chiefly intended for keeping the artificial piece in its place, and that the firmness and steadiness of it must depend entirely upon the accuracy of the fitting.

160. It very frequently happens, in cases where an entire set of teeth is required for one or both jaws, that, however accurately the socket may fit to the surface, it cannot be in the slightest degree fixed by the aërial pressure. This circumstance would almost lead us to suppose, that, in those instances in which artificial teeth are attached in this way, it may in a great measure depend upon some peculiar but unknown condition of the gum, which is favorable to the adhesion.

161. The piece, however, may always be firmly fixed to its

place by the application of a pair of spiral springs, and it will generally be found preferable to use them even in those cases in which a considerable degree of the atmospheric pressure appears to be exerted; as they never occasion any annoyance in the mouth, and always afford great additional security.

162. These spiral springs should be made of hard gold, of the quality of eighteen carats, rendered elastic by drawing it through the successively smaller openings of a steel plate. When thus reduced to the requisite size, the gold is to be coiled up, in a spiral direction, on a piece of wire, or by an instrument contrived for the purpose. Each spring should be two inches long, and both of them must be of an equal strength.

163. To the extremities of the springs, small swivels, or eye-lets, are to be adapted, by means of which they are to be attached to the piece. These eye-lets are to be fixed, by a rivet, to pieces of gold wire, screwed to the sides of the sockets; a small piece of gold, termed a "washer," being interposed between the swivel and the head of the nail, to diminish the friction, and allow greater freedom of motion.

164. The spring should, on each side and in both jaws, be placed at an equal distance from the centre of the mouth. The most favorable point for fixing them, is at that part of the piece which corresponds to the line between the bicuspidæ, although their position may sometimes be slightly varied, if any of the natural teeth remain in the mouth in this situation.

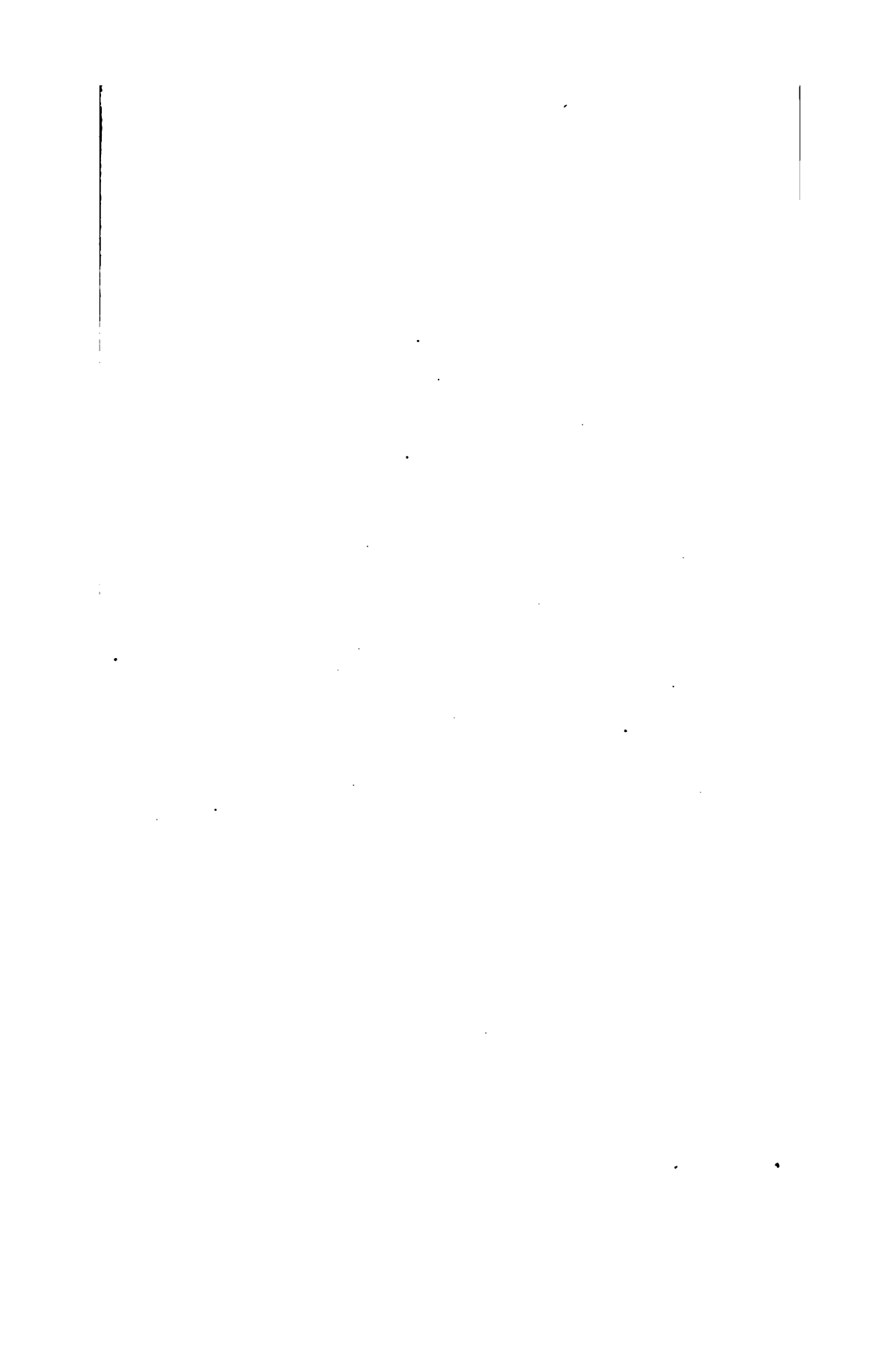
165. It has already been mentioned that a considerable obstacle is often presented to fixing the springs in those cases in which most of the posterior teeth of one jaw remain, while all those of the other have been lost, and spiral springs are required to keep the artificial set in its position. Thus, for example, if all the upper teeth have been lost, and none of the under set, excepting the two posterior molares, on each side, the springs will not act properly, if fixed so far back in the under jaw; but the difficulty will be easily overcome, by attaching to the socket a small piece of gold plate, which should project as far forward as the point opposite to the small grinders, where a pivot of gold wire is to be soldered to it, to which the swivel of the spring is to be fixed. Again, if none of the under teeth have been lost, and spiral springs are necessary to fix an upper set, a plate must be struck up, to fit the surfaces of the inferior molares and adjoining bicuspidæ, in the form of a cap, to which the springs are to be attached, in the manner already mentioned.

Some other cases of a similar nature may occur, for which the practitioner will readily be enabled to provide, if he possess but ordinary mechanical knowledge.

I have thus far attempted to describe the mode of constructing

artificial teeth. The observations which I have made are entirely of a practical nature ; and nothing has been advanced but what has been substantiated by experience. If any part of the course which I have recommended shall be found to have been inadequately explained, I trust it will be attributed to the difficulty of imparting information in this manner, on a strictly manual art ; and that the justice will be done me, of believing that it does not proceed from any of those unworthy motives of concealment, by which so many of the profession are influenced.





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A  
T R E A T I S E  
ON THE  
DISORDERS AND DEFORMITIES  
OF THE  
TEETH AND GUMS,

EXPLAINING  
THE MOST RATIONAL METHODS OF TREATING THEIR DISEASES.  
ILLUSTRATED WITH CASES AND EXPERIMENTS.

~~~~~  
BY THOMAS BERDMORE,
MEMBER OF THE SURGEONS' COMPANY AND DENTIST TO HIS MAJESTY.
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Dente quid horridius nigro, quid pulchrius albo?

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BALTIMORE:
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1844.

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P R E F A C E

TO THE AMERICAN EDITION.

ALTHOUGH since the time of the publication of the Treatise which we now offer to our readers, (1770,) the science of Dental Surgery has made great advances, we nevertheless think it a work well worthy of a place in the Library part of our Journal. Mr. Berdmore, during the period of his professional career, ranked deservedly high as a Dentist. No English practitioner, in this department of the curative art, at this time, enjoyed as high a reputation for skill and professional knowledge, and although his work has been scarcely noticed by subsequent writers, it is unequalled, in point of merit, by any previous British publication ; and in thus rescuing it, as it were, almost from oblivion, we believe we shall receive the thanks of our brethren generally. We had at first intended to append notes to it, descriptive of the present established principles and practice of the art, but upon reflection we came to the conclusion, that, inasmuch as that if we were to do this, the annotations would be more copious than the text, it would be as well to publish it as it is, without comments. The work, therefore, is principally valuable only as a book of reference. It is not offered as a practical guide to the student.

EDITORS AMER. JOUR. OF DENTAL SCIENCE

P R E F A C E .

WHEN first I resolved to devote my whole time and attention to that part of Surgery which concerns the Dentist's art, I observed, with regret, that no material instructions were to be derived from the writers of this country who have touched on the subject; therefore I endeavored, for my own improvement, to collect carefully, from my predecessors in business, and from practice, whatever I thought conducive to the advancement of it.

After a few years thus employed, I found, or I thought I had found, my observations and discoveries in some measure worthy of being communicated to those who practice in this business, to the parents who are solicitous for the health and beauty of their children, and to the patients who are affected with disorders or deformities of the teeth. I therefore endeavored to reduce them to some order, and at last resolved to commit them to the press.

The work being originally designed for artists, *who are not much given to reading*, and for patients who do not love too much trouble, I purposely avoided quotations. Indeed, without departing from the subject, I could only have quoted a few French authors, who have written *to make their names known*, and one or two English, who have translated very injudiciously.

The oratory of the pulpit and the bar, and above all the art of pleasing in conversation and social life, are matters of the highest concern to individuals. But in these no one can excel whose loss of teeth, or rotten livid stumps, and fallen lips and hollow cheeks, destroy articulation, and the happy expression of the countenance; whose voice has lost its native tone, and whose laugh, instead of painting joy and merriment, expresses only defect and disease.

A foulness of the teeth is by some people as little regarded as it is easily removed; but with the fair sex, with the polite and elegant part of the world, it is looked on as a certain mark of nastiness and sloth; not only because it disfigures one of the greatest ornaments of the countenance, but also because the smell imparted to the breath by dirty rotting teeth, is generally disagreeable to the patients themselves, and sometimes extremely offensive to others in close conversation.

The *design* of this short treatise then, is to obviate and remove these evils; to render the art which I profess of more extensive utility; to communicate to the public the advances I have made in it; and lastly, to rescue it from the indifference and unmerited contempt with which it has hitherto been treated, by those especially who are pleased to comprehend under the idea of tooth-drawing or tooth-scraping all that is necessary to be known or advanced on the subject; and therefore place on an equal footing with the surgeon dentist, the tooth-drawing barber and itinerant mountebank.

CHAPTER II.

The Method of this Treatise.

For the sake of brevity and precision, I shall divide this little work into three parts.

In the first, the teeth and the parts with which they are immediately connected, shall be considered and described in their natural and sound state.

In the second, I shall treat of the teeth and contiguous parts, in their diseased state, and annexed to each disease I shall give the methods of cure.

In the last part, I shall teach all the various means which prevent disorders of the teeth, and which have been found, by long experience, conducive to their soundness, regularity, good color, smoothness, and firmness in the sockets, and to the lasting preservation of them in old age.

This last part, although it will contain instructions for every age, I must beg leave to address particularly to the ladies who

have young children, and to the governesses who have the care of them, and who are studious to cultivate in them whatever is admired in society, and useful in itself.

For in the early periods of life, whilst the teeth are forcing a passage through the gums, and afterwards when the time of shedding approaches, it rests more with the mother and the nurse to make them good or bad than is generally imagined: then nature can be cherished where she is kind, assisted when feeble, and easily directed or restrained when irregular or luxuriant.

CHAPTER III.

Anatomy and Physiology of the Teeth, and parts adjacent.

A PERFECT knowledge of the structure of the teeth, and of the parts to which they are immediately connected, is the basis of all rational practice, as well in diseases as in superficial deformities of them.

I wish, therefore, for the sake of those who practise drawing, cleaning, and other operations on the teeth, that this necessary instruction could be imparted by writing: but that is impossible; for a regular study of anatomy, under proper professors, ocular demonstrations, and judicious dissections, often repeated, are absolutely necessary.

I would have it understood, therefore, that I do not attempt to teach the anatomy of the teeth in this manner; but that I mean only to give such a general idea of these parts in their natural and sound state, as to enable every person, however slightly conversant in these matters, to comprehend whatever shall be said hereafter concerning the disordered condition of them, and to determine, in some measure, how far the practice which I adopt, is rational, or likely to succeed.

The teeth, in grown people, are small bones, of various figures and sizes, fixed immoveably in their sockets, by a species of articulation, by the anatomist called *gomphosis*.

That part of them which is sunk in the socket, is called the *root*; that which is exposed to view, the *body* or *crown*; and the circular ridge or line, which limits and distinguishes these two parts, is called the *neck* or *collar* of the tooth.

The substance of the teeth is extremely different from that of other bones, being denser, whiter, and not apparently laminated, nor subject to exfoliation.

The *body* of the tooth is crusted over with a very white, smooth polished substance, called *enamel*, which only extends as far as the *collar*, whatever some anatomists may have said to the con-

trary ; it differs in many circumstances from the bony part underneath, as shall be related more at large hereafter, and it is so hard as to strike fire with steel like flint ; viewed with a microscope, it appears to be composed of short radiated fibres, proceeding perpendicular to the plain or surface of the part from which they arise, and its thickness seldom exceeds half a line, or the twenty-fourth part of an inch.

This enamel is formed before the tooth appears above the gums ; it thickens, hardens, and polishes, until the age of twenty or twenty-five, and afterwards is repaired no longer, but gradually wears by continued use.

The *roots* of the teeth consist of one uniform substance ; they are only covered by a periosteum, or thin membrane, which follows them to the bottom of the sockets, and helps to connect them with the diploe, or spongy osseous substance, which forms the inside of each socket.

The *collar* of the tooth, all round, is firmly connected to the membrane of the gums, which, in this place, seems to unite with the periosteum above mentioned.

The *substance* of the *gums* is compact, elastic, and in some measure resembling the texture of leather ; it is fixed to the jaw bones by means of their periosteum ; it covers the whole alveolar border of both jaws ; insinuates itself between the teeth ; encompasses the collar of each, and is firmly connected with it. The gums, therefore, on the outer and inner sides of the teeth, are one continued piece, containing as many openings as there are teeth ; and the membrane which covers them seems to be a continuation of that which goes to the lips, cheeks, and tongue.

The teeth, considering their size, are plentifully supplied with *nerves* and *blood-vessels*, which enter through a small hole at the points of their roots, and after passing through a straight channel as far as the crown, are divided and diffused all over their substance : this hole lessens as we advance in years, and at last is totally obliterated.

The *arteries* proceed from the internal carotids, the *veins* return to the jugulars, and the *nerves* are branches of the fifth pair.

The nerves of the upper and lower gums are branches of the maxillaris superior and inferior, which come from the fifth pair ; they also receive branches from the portio dura of the auditory nerve, which inosculate with the former in a singular manner, and give rise to certain sympathetic affections related in the second part of this work.

The use of the gums is to support the teeth, to fill up their interstices to keep them firm, and to protect their roots from the injuries of external air, of the salivary liquor, and of acrid food.

The *number* of the teeth varies in different periods of life, as shall be shown hereafter; at present, we shall only consider them in their most perfect state.

After the *dentes sapientiæ* have appeared, there are sixteen teeth in each jaw, which are divided into three classes; the first including the four anterior teeth, called *incisores* or *cutting teeth*; the second including the two next, one on each side, called *canini* or *dog teeth*; and the third including the other ten, five on each side, named *molaes* or *grinders*.

The incisors of the upper jaw are larger and broader than those of the lower; and of the upper ones, the two in the middle are the largest.

The *roots* of the incisors are long, pointed, and single; the *bodies* are wedge-like, convex on the outer side, a little concave within, flattened on the sides, and so disposed that their sharp edges lie all in a line, making one *uniform edge*.

The *dentes canini*, so called from their prominence and similitude to the teeth of dogs, and also *eye-teeth*, on account of their situation, stand on either side of the incisors.

Their *bodies* are thicker, more prominent, pointed, and rounder on the outside, than those of the incisors; and their roots are thicker, longer, and more pointed. Sometimes they are so long as to perforate the bottom of the maxillary sinus.

Of the *dentes molaes*, or *grinders*, the two first in each row are small, the two next larger, as are the last also, called the *wise-teeth*.

Their *bodies* are generally short, ~~very~~ thick, irregularly cylindrical, or rather with four sides a little rounded, and terminated by a broad end, more or less filled with obtuse points, cut in some measure like so many diamonds, whence the name of crown is most frequently given to the bodies of the molaes, because the resemblance is greater than in the others.

The crowns of the ~~two~~ small molaes are often less than the bodies of the canini, and seldom have above two points, or three at most.

In the two large molaes the crown is of much greater extent, and the points are three, four, and often five in number.

The fifth grinder, or *dens sapientiæ*, has a crown much like the two former, but often more rounded and with fewer points. We sometimes find it, even in advanced age, wholly hid in its socket.

The *roots* of the molaes are long, more or less flattened, single in some of them, in others two, three, or four, but rarely five in number. Sometimes all these roots are distinct, sometimes wholly united, and often united only in part. They are generally straight, and more distant from each other at the extremity than

at the neck of the tooth, because they taper to a point; but in some instances these points are bent inwards, outwards, and in other directions.

The *roots* of the *small grinders* often appear single, without being so in reality; for, on examining them narrowly, we find they have two roots united, or as it were soldered together. Sometimes the only distinction that appears consists in a slight separation at the point.

The *great molares* have several roots; in the upper jaw three or four, but in the lower jaw only two in general.

The fifth molaris, or *dens sapientiæ*, has often only one root, but more commonly two, which are conical and seldom long; thence it happens that this tooth is generally lost in old age before any of the other grinders.

It appears then, that the grinding teeth of the upper jaw have more roots than those of the lower; and in mastication, or when the mouth is shut, the upper row, especially in the fore part, advances beyond and slides over the lower, instead of meeting it. In some people, however, they do meet, but seldom fail, in that case, to destroy each other, or to be worn down very early in life by their constant rubbing and pressure.

It is perhaps unnecessary to add, that the teeth serve for mastication, for the distinct articulation of sounds and for ornament.

CHAPTER IV.

The Formation, Growth, and Shedding of the Teeth.

IN dissecting the alveolar arch of either jaw-bone, in infants newly born, we observe, in each socket, a collection of soft, white, glairy matter, contained in a small membranous sack, pierced on that side which corresponds with the bottom of the socket, by a nervous and vascular cord, whose vessels presently divide, and are branched all over the membrane and contained substance.

This is the tooth in *embryo*, whose future nourishment, growth, and ossification is to be derived from the matter conveyed by these vessels.

The first sprouting of the teeth through the gums happens sooner or later, according to the health or vigor of the child, and is called the *first dentition*.

It begins in the second, third, fourth, fifth, or sixth month after birth, is seldom finished before the second or third year, and proceeds in the following order, pretty nearly.

Within the first three or six months, appears one of the front incisors of the lower jaw; then, after a little time, the other; a

few months afterwards the great incisors of the upper jaw come forth, both nearly at the same time; then come the two lateral incisors of the lower jaw, and the two small ones of the upper one, in some little time after the other; then appear the two canini of both jaws; and in some months more, or about the second year, the small molares shoot forth successively: so that at the end of the second year, in general, a child is furnished with ten teeth in each jaw, which are called *milk-teeth*.

The *second dentition* is in the sixth or seventh year, or thereabouts, and produces the four first great dentes molares, one at either extremity of both jaws.

The *third dentition* happens in the tenth, twelfth, fourteenth, or fifteenth year, and furnishes four other great molares, one close by each of the former.

Finally, about the twentieth year, and in some people long after, comes the *last dentition*, which gives the four extreme dentes molares, called dentes sapientiæ, from their coming after puberty.

It is to be observed, however, that this order varies considerably in different people and different constitutions. Instances are recorded of children born with their teeth already cut; others, particularly those who are rickety, do not cut their teeth before the fifteenth month or later; and we every day observe that the dentes sapientiæ in some people come very late, or never come at all. Some have more than the ordinary number of teeth in one row, others have the supernumerary ones in a double row, or standing apart without any order, owing to a circumstance which we shall touch on hereafter.

The first twenty teeth, or *milk-teeth* mentioned above, generally last till the sixth or seventh year; after that, until the fourteenth or fifteenth year, they fall successively, and are succeeded by others, most commonly without any considerable pain, and almost in the same order which they observed in coming forth at first.

The *shedding* of the teeth is wisely intended, and brought about in a singular manner. Their extremely hard enamel, and the rigidity, of their bony substance, will not admit of distension and free growth, like other parts of the body. After an enlargement of the jaw-bone, the original teeth are no longer sufficient to fill up the extended alveolar space; they must stand single and unsupported by each other, and leave interstices remarkably hurtful to mastication, to speech, and the symmetry of the countenance; the enamel also is not regenerated when once lost, and that coat, which was given in infancy, would be too slender for the uses of long life.

Nature, therefore, has kindly placed under the milk-teeth the

stamina of another set, which, in due time, acquires a greater *size* and *solidity* than the former, and by their constant pressure on the roots of the milk-teeth, rob them of their nourishment and hold, and finally push them entirely out of the sockets.

Hence, in children of two or three years, we find ten grown teeth in each jaw, ten stamina under them, and also the stamina of the six molares which come forth afterwards.

Before we conclude this part, I think it necessary to relate an observation, which, although unsupported by the evidence of any other writer, I am convinced is perfectly true, and applicable to good purposes in practice; that is, the molares of the second dentition are considerably smaller than the milk-molares to which they have succeeded, notwithstanding the increased size of the jaw-bones; therefore, what we have said above of the increased size of the teeth, applies only to the incisors and canini.

PART II.

Of Diseases of the Teeth and Gums.

To treat minutely of all the diseases of the teeth, and to follow them through all the varieties and subdivisions which occur in practice, would alone furnish matter for a large volume, and the method would be equally tiresome and unprofitable to the reader.

I shall therefore rank them under general heads, placing together all those which agree pretty nearly in their general symptoms and indications of cure.

CHAPTER I.

Of the Tooth-ache.

OF all the diseases to which the human body is exposed, the tooth-ache is perhaps the most frequent, and the most commonly mistaken as to its causes and methods of cure; because the disorders that give rise to it are extremely numerous; because they are not easily detected or traced; and because the people who are generally applied to on this occasion are very ignorant. For taking out the tooth, which the patient complains of, is their universal cure, without considering that the pain may often be removed by gentler methods, or that it may arise from disorders which never fail to be exasperated by such treatment, or that it may be owing to *sympathy*, which I have often observed to produce a sensation of exquisite pain in the sound tooth on one side, whilst a rotten one on the other was the sole cause. Nay, sometimes, a cariated tooth has produced violent pain in the corresponding one of the opposite jaw.

Indeed, the tooth-ache cannot be treated with any certainty of success, unless we trace the causes of it, and pay close attention to them in the cure; for, although in its progress it often becomes a violent disease, producing inflammations, restlessness at night, head-aches, glandular swellings, hysteric fits, delirium, abortions, fevers, and a variety of dangerous diseases; yet, in its rise, it is merely a symptom of disease in the teeth, gums, periosteum, or sockets, the removal of which will remove the tooth-ache of course.

Whether we consider it as a violent disease, or as a *troublesome symptom*, we are necessarily involved in the investigation and removal of its causes, as much as in the pursuit of means to alleviate or suppress the pain for the instant; and hence it happens that the *tooth-ache* cannot be treated apart from the *disorders* which usually produce it, without omitting what should be chiefly insisted on, or without giving rise to endless repetitions, prolixity, and confusion.

We shall, therefore, in this place, only enumerate the various disorders which occasion the tooth-ache, leaving the diagnostic and curative part to be more fully considered under each head respectively.

1. A tooth-ache often arises from *defluxions* falling on the gums, the neighboring periosteum, and bone, particularly after catching cold. 2. From *obstruction* or *inflammation* of the nerves and vascular parts of the tooth itself. 3. From *purulent* or *acrid matter*, generated in any of these parts, in consequence of inflammation, extravasation, or acrimony of the fluids. 4. From fungi, excrescences, and ulcers of the gums. 5. From a *recess* of the *gums*, occasioned by scorbutic, venereal, or putrid disorders, whereby the roots of the teeth are exposed to external air and injury. 6. From *tartar* of the teeth, extending itself along the roots, and injuring the gums. 7. From *looseness* of one or more teeth, occasioned by violence, loss of gums, salivation, or putrid disease. 8. From *injudicious extraction*, whereby the tooth is frequently broken low down, the gums are bruised and torn away, the neighboring teeth exposed at their roots, the external side of the socket very often considerably injured, and splinters raised which produce lasting pains and inflammation. 9. From sudden alternations of *heat* and *cold*. 10. From *sympathy* with the neighboring affected parts. 11. From *collections* of *matter* formed in the *maxillary sinuses*, and in the cancellated parts of the lower jaw. 12. From *caries* or *exostosis* of the bones which form the sockets. 13. From *caries* of the tooth itself. 14. From *loss* of *enamel*, whereby the sensible, irritable part of the tooth is exposed. 15. From a *fracture* of the tooth. 16. From *dentition*. 17. And lastly, from the affection called *tooth-edge*.

CHAPTER II.

Of Defluxions falling on the Gums, and the Tooth-ache arising therefrom.

THE *lensor* of the fluids, the *spasmodic* affections of the solids, and the *tension* and *overcharge* of the vessels which are observed

to take place, in consequence of catching cold, are apt to generate obstructions and inflammation; and the tender parts which are most exposed to the influence of external air, generally suffer first. Hence, heaviness of the head, inflammation of the pituitary membrane, irritation and increased action of its glands, &c. hence, also, an uncommon tension and repletion of the vessels of the gums, periosteum, teeth, and neighboring glands, the increased flow of the saliva, and the sensation of pain on these occasions.

But those who have caught cold are not the only people that are subject to this disorder; for the same general causes, which produce extraordinary repletion and irritability in other parts, produce them here also; and it is observable that women who are not regular, and also women with child, are remarkably subject to a tooth-ache of this kind, for reasons easily deducible from what has been said above.

This sort of tooth-ache is distinguished from others, by observing that some of the general causes which we have just now mentioned have preceded; that a sense of fullness in the gums, and an uneasiness about the sockets of several teeth, have been succeeded by an uncommon flow of saliva, and a swelling of the gums, extending itself more or less to the muscles of the cheek and face, on the affected side; and lastly, that the pain is not confined so much to one tooth, as happens in other cases; for if it be that the tooth so affected appears perfectly sound.

This tooth-ache is extremely common in the winter season, and the *barbers* are indebted to it, beyond all others, for the plentiful supply of *beautiful sound* teeth, which it furnishes to *ornament* their windows and signs withal. For the people, distracted with pain, run to the first barber-dentist's shop that presents itself; and the operator instantly applies the *universal cure*, the instrument, without wasting time with observations and questions.

If this absurd practice were only attended with the loss of a sound tooth, it would not, perhaps, in the opinion of some people, deserve to be considered in a serious light; but that is not all. The extraction of a sound tooth, whilst the gums and periosteum are swelled and inflamed, is not performed without tearing and wounding them in such a manner as increases the evil, renews and exasperates the irritability, disposes the parts to inflammation, and uncovers the roots of the neighboring teeth, when they are most susceptible of pain, obstruction, and decay; and hence it appears that the loss of the neighboring teeth, which so constantly follows the extraction of a sound one, in *defluxions*, is occasioned by the *operation*, and not by any contagion, or communication of putrid matter, as pretended on these occasions.

The common method also of giving acrid, aromatic substances

to be chewed, such as ginger, galangal, Florentine orris root, cloves, allspice, mace, camphor, orange peel, peppermint leaves, caraway seeds, and many other stimulating applications, in various forms, is often productive of very dangerous consequences, notwithstanding the discharge which they occasion. For it is to be considered that the liquor of the *salivary glands*, and not the contents of the *distended, obstructed vessels*, comes forth on this occasion; and since there is no real direct evacuation of the latter, stimulating medicines, applied to the very *seat of inflammation*, to the distracted irritable fibres, must increase the repletion, tension, and pain.

The true and rational method of cure is comprehended under four general indications:

1. To lessen the velocity, quantity, and inflammatory disposition of the blood.
2. To relax the affected parts by topical applications, and sometimes by scarifications.
3. To make a revulsion by means of irritation, and by discharge from a neighboring part.
4. And lastly, to lessen the sensibility of the pained parts by the use of external and internal sedatives.

1. The first indication is answered by bleeding and purging, and frequent repetitions of nitrous draughts.

2. The second, by keeping the mouth constantly moistened with emollient, attenuating liquors, such as decoction of marsh-mallows, comfrey, or satirion roots, or of columbine, or quince seeds, with a little nitre; by applying poultices of bread and milk to the affected cheek externally, and boiled or roasted figs internally, and also by scarification of the gums; but this last should only be practised when the inflammation is very violent, and where the obstruction has lasted so long as to leave no hopes of resolution.

3. The third indication is most effectually answered by the use of blisters applied to the ears and nape of the neck, some are fond of sternutatories and leeches, but I think to little purpose.

4. For the last intention, opium is to be added pretty freely to the above mentioned emollient liquors, and given in due doses at night to procure rest.

Thus much it is the duty of a surgeon dentist to tell the patient, in general terms, to prevent his falling into ignorant or dishonest hands. But for the well timed and judicious application of such methods, a physician or surgeon should be consulted. For he who wanders beyond the *limits* of his profession, is subject to errors which never are forgotten; or his advice, however judicious, fails of due respect, and always goes unrewarded.

In looking over my notes on this subject, I observe that defluxions, mixed with other diseases of the teeth and gums, are much

more frequent than cases of *simple defluxion*. But since the limits prescribed to this little work will not admit of many narratives of this kind, I must content myself with offering one case, which I take to be more instructive than any of the rest, on account of the frequency of its return, and the constant similarity and simplicity of its symptoms.

A married young woman, about twenty-one years of age, came to me in December, 1766, to have a tooth taken out. Her face was greatly swelled on the right side, as were also the parotid and submaxillary glands; and she could not, without great pain, open her mouth wide enough to give me an opportunity of examining it perfectly. Her teeth were remarkably white, regular, and sound, but the gums were swelled to a considerable degree, particularly on the affected side, and the saliva flowed into the mouth in much greater quantity than is usual in the natural state.

After having asked her some questions relating to her disorder, I found that she had been attacked with the same complaint three or four times before, and at very distant intervals.

She said it came on with a sense of heaviness and oppression in that part of the forehead which joins with the nose; then followed a *running* at the nose, which soon ceased, and was generally succeeded very quickly by an uneasiness of the gums, a general pain of the teeth on that side, and a flow of limpid spittle. But the face and glands had never swelled to so great a degree as happened in the case before us, and therefore she was resolved to have a tooth drawn, to prevent the danger of any future complaints of the same kind.

Determined by the symptoms and progress of the disorder, and by the soundness of all the teeth, which I examined with the greatest care, I told her that the extraction of the tooth could not give any relief, that it could not prevent a return, and it would give excruciating pain, and might be attended with very dangerous consequences in the present inflamed state of the parts.

With a good deal of persuasion I prevailed on her to lay on a large blister to the nape of the neck, for she would not submit to the application of it behind the ear. I advised her to get from her apothecary a cooling purge, and to drink plentifully of water-gruel, with a little nitre.

As soon as ever the blister began to run, the pain abated, and in two days the swelling was almost entirely gone. In about ten days afterwards she gave me thanks; and as she never since has called, I presume she has not had any return.

CHAPTER III.

Of Obstructions and Inflammation of the Nerves and Vascular Parts of the Tooth and the Tooth-ache arising therefrom.

THESE disorders of the nerve of the tooth are not easily discovered; and therefore, in tracing a tooth-ache of this kind, we are obliged to make use of negative, rather than positive signs.

It is certain that wherever there are vessels and nerves, *there* obstruction, inflammation, and pain may be seated. In very lasting pains of the teeth then, which can be referred to no other cause, which are not attended with the diagnostic signs which distinguish all the other disorders mentioned in this work, we may justly direct our inquiries to this hidden source, and rather assume a rational probable opinion, than act blindly without any opinion at all.

This species of tooth-ache is relieved by *counter-impression* and *sedatives*. Acrid masticatories, formed chiefly of the substances mentioned in page 18, are often of considerable service; for the irritation which they give to the neighboring soft parts, often diverts the mind from that of the disordered nerve; and perhaps the discharge occasioned by them directs the course of the fluids towards the glandular and superficial parts, instead of urging the affected nerve. *Burning* the ear with a hot iron has also been practised, under the notion of *counter impression*; and if we can credit authors, and some modern histories of this kind, with considerable success.*

For my own part, I do not approve of such treatment. I know it is not often attended with success; and even where it is, the relief is only for a moment; for it is owing to the terror and agitation of mind naturally connected with the idea of burning, more than to any pretended connection of nerves; and I have, in my own practice, seen people relieved of pain on the appearance of the surgeon, and by the dread of the operation, as often as any man can pretend to have cured by the actual cautery, applied in such a manner. I would never advise, therefore, to amuse the patient with such a precarious experiment, whilst more rational and more effectual methods may be used; such as blisters laid on behind the ears, and to the nape of the neck, and sedatives used externally and internally. If these do not succeed, extraction is the last resource.

With respect to the virtues of the *loadstone*, and of certain

* Since the publication of this Treatise, I have received such strong assurances, from different persons, of the efficacy of this application, that I can scarce doubt but that good effects may sometimes have arisen from it; and, in such cases as admit of any probability of success, perform the operation, as it is attended with no danger or bad consequences.

charms and incantations, so impudently affirmed by vagrant mountebanks and imposters, I hope the intelligent reader will readily join with me in treating them with contempt, and in pitying the poor people who are so easily and so grossly imposed on.

When the disordered condition of the nerves of a tooth has been of long duration, it frequently extends itself along the body of the great nerve into the substance of the diploe, and also to the nerves of the periosteum, which surround the root; and then the slightest motion of the tooth, or pressure, or the touch of a hard body, excites a sensation of pain. In this state the disorder is easily distinguished, and the instrument should not be used until the above-mentioned methods have been fairly and patiently tried. Although I have taken a good deal of pains to note down all that has occurred in my practice relative to such pains of the teeth as are not attended with any *visible* disorder of the teeth or gums, I must own, I am not yet certain that the cause is such as I have suggested, nor can I presume to say whether the cure, in any instance which has hitherto presented itself, should with most justice be attributed to the masticatories which I recommended, or to chance, or *nature only*. Therefore I shall not attempt to recite any cases of this kind, until I am better informed.

CHAPTER IV.

Of Acrid Matter, generated in the neighborhood of the Teeth, and the Tooth-ache arising therefrom.

THE *gums, periosteum, and vessels* of the teeth and sockets, as they are subject to obstruction and inflammation, are necessarily affected sometimes with purulent matter, which by lying long on these parts, or on account of its peculiar acrimony in certain circumstances, irritates the nerves, affects the roots of the teeth, and produces lasting pain.

This disease is easily distinguished by the appearance of the purulent matter, by the separation of the gums from the teeth, which generally attends it, and by the disagreeable smell of the breath, which is often perceptible to the patient himself.

It is cured by making one or more incisions to the very bottom of the cavity in which the matter lodges, and by giving a free passage to it at the most depending part. The wound is to be frequently dressed with stimulating balsamics, such as balsam copaiba, or tincture of myrrh, received on a dossil of lint; and when it is almost healed, the mouth is to be washed four or five times a-day with some astringent gargle, such as the decoction of tormentil or bistort root, &c., to brace and strengthen the newly

generated gums. If the pain be considerable, solutions of opium and camphor should be added to the dressings, as well as to the astringent washes last mentioned.

The tooth so affected should never be drawn until a surgeon of proper judgment has declared his art ineffectual, because there is always the highest probability of cure without losing it; and without proper care and treatment, the same matter which occasioned the hasty extraction of one tooth, may continue to affect the neighboring ones in the same manner.

Children at the time of the second dentition, are more frequently affected with this disorder than other people; for the growing teeth sometimes meet such a resistance from the milk-teeth, which lie over them, as occasions inflammation, which often terminates in suppuration.

Some months ago I was called to see a child of nine years of age, who had been troubled for a fortnight, or three weeks, with what the attendants called a *tooth-ache*, attended with a swelling of the cheek, and some degree of fever. Upon examining his mouth, I found a considerable quantity of matter collected in a sinus, which ran from the external side of the small molares of the left side, almost down to the angle of the jaw. I opened it immediately with the common *gumflea*, the pain soon abated, and with proper dressings I brought it to heal in less than a fortnight: from the same cause it happens sometimes, that the matter makes its way externally, when long neglected, and leaves unsightly scars, which never disappear.

When the imprudent use of mercury has produced violent inflammations and ulcerations of the gums, before the venereal infection has been expelled, the fetid putrid state of the fluids in these parts, joined with the venereal *poison*, renders the matter which oozes from them so acrid, that the slightest sores frequently extend themselves all over the gums, and sometimes go deep into the neighboring soft parts.

Such cases I have seen attended with very violent pains of the teeth; but as they belonged more properly to the surgeon, I have very rarely interfered in the cure.

But of all disorders, the scurvy is the most destructive to the teeth and gums; for it not only brings on ulcerations of the soft parts, but also attacks the membranous lining of the sockets, destroys the nerves at bottom, and deprives the teeth of nourishment; in consequence of which they become discolored and loose.

Cases of this kind occur every day; and it is to be observed, that although simple ulcers of the gums may be cured by the treatment above-mentioned, here it will avail nothing; for the pain cannot be removed by curing the external ulcers, whilst the

chief source of the disease lies out of reach ; nor can any applications to the gums fasten the teeth or remove the pain, whilst corrupted matter surrounds their roots and preys upon the sockets.

In this case, therefore, it is necessary to take out the loose teeth; and the *operator* will always find that their roots are evidently covered with the corrupted matter, which rendered the extraction advisable and necessary.

CHAPTER V.

Of Fungi, Excrescences, and Ulcers of the Gums, and the Tooth-ache arising therefrom.

A tooth-ache arising from fungi, excrescences, and ulcers of the gums is easily distinguished, as the cause is external, and obvious to every person in the least acquainted with surgery, or even the natural state of the parts.

When they take their rise from a general disorder of the system, *that* should be first attended to, and opposed by proper medical treatment; then the excrescences are to be removed by the knife or scissors, and the wound is to be dressed as mentioned in page 21; for oily or emollient applications do not answer as dressings for the gums, as they do for muscular parts, nor can they be borne conveniently in the mouth.

Ulcers of the gums, where they do not touch the teeth, or form cavities, need only be treated with balsamic applications at first, and then with astringents, such as tincture of myrrh, sang. dracon. tormentil, bistort, &c., so soon as they are disposed to heal. The pain felt on these occasions, and which is called tooth-ache, on account of its being extended to the teeth by connection of the nerves and membranes, is to be mitigated by opiate and camphorated applications; but if the inflammation and soreness are considerable, emollient gargles, such as decoction of quince-seeds, barley-water, or milk and water, with a few drops of tinct. thebaic. should be constantly kept in the mouth, until the state of the parts admits of the treatment mentioned above.

As the *extraction* of a tooth on this occasion is rather dangerous, than likely to avail against the pain, those who practice in this way, should take care always to examine the mouth all round before they apply an instrument; and when there are appearances, such as we have described, they should send the patient to a surgeon, to whom this case more properly belongs, than to a dentist.

When excrescences of the gums have been long neglected and suffered to grow to a considerable size, the vessels, which supply

them, enlarge proportionally, and the cure is attended with uncommon difficulties.

A gentleman, aged about fifty-six, in a tedious and sickly passage from the East-Indies, was troubled during the three last months of the voyage with painful ulcers of the gums in the upper jaw particularly. Soon after his arrival they gave him no more trouble; but after three or four months he found a swelling, which was situated in the gums, near the internal side of the small molares of the upper jaw, on the right side, to become a little painful, and it enlarged every day. Thinking that this would *come to a head* (as he termed it) and then disappear of its own accord, like the former ulcers, he neglected it for two or three months longer, by which time it became as large as a walnut, very painful, and affected his speech. A friend of mine suspecting that it arose from some fault of the teeth, for they were all discolored and dirty, told him to call on me. I advised him to have it immediately cut away even with the surface of the gums, which he readily consented to, and insisted on my doing it. After having prepared an astringent gargle, I performed the operation with the *crooked bistoury*. The blood poured forth very quickly, and the astringent liquor, which I advised him to keep in his mouth, did not check it in the least: I was therefore obliged to cut a piece of agaric of the proper size, and to apply it with a thick compress of linen, which the patient held fast on the part for two hours. We then attempted to take it away, because the gentleman could not eat or sleep in this manner; but the blood flowed again in considerable quantities, although not quite so fast as before, and I found it necessary to lay on another piece, not quite so thick as the former, which was continued till it dropt off the day following. For three or four days his mouth was frequently washed with astringent gargles; after which I thought it best to commit it to nature; but in five or six days he returned, and said, the excrescence began to shoot forth again; I found he was right, and notwithstanding the frequent applications of rougher astringents, six weeks were elapsed before it began to lessen and heal.

Had any matter appeared at the root of this tumor when it was cut away, I should have laid bare the bone and examined it; but the healing of the wound in some time after the excrescence was repeatedly taken down, showed that the bone was not in fault.

CHAPTER VI.

Recess of the Gums, Exposure of the Roots of the teeth, and the Tooth-ache arising therefrom.

SCORBUTIC, venereal, and putrid disorders dispose the fluids to acrimony, and the solids of the whole system to dissolution.

The gums in these cases generally suffer very early, because they are most exposed to violence and injury, and to the external air, which is the most powerful agent in putrefaction; and also because in venereal cases the medicines generally administered seldom fail to bring on inflammation and ulcers of these parts.

The roots of the teeth are often exposed without any sensation of pain, especially when the gums have receded slowly, and when the successive portions of the roots so exposed have been gradually withered and dried, and their nerves thereby deprived of their accustomed sensibility. But even then the evil is not the less formidable, because the teeth are exposed to caries, to catch and retain portions of food in their interstices, to give a stinking breath, to be loosened, and even to be pushed entirely out of their sockets on every slight occasion.

A tooth-ache arising from this cause is easily distinguished by looking into the mouth, and by finding that the patient is, or lately has been, troubled with some of the above named disorders. If the exposed roots are become carious, extraction is the only cure; because, the bony substance of the teeth never exfoliates, or unites with the gums or periosteum, where it is thus affected; nor even although the carious surface should be cleared away by puncture, scraping, or otherwise.*

But as this is not often the case, and as the roots of a number of teeth, in the forepart, are frequently long exposed, without any strong appearance of bad colour or decay, the disease and pain are to be removed in a more effectual and judicious manner

The treatment is partly medical, partly chirurgical: the former consists in removing the original and general disease of the whole body by a due course of medicine, and in washing the mouth frequently with antiseptic and astringent liquors, such as infusion of roses, betony, granate-peel, bistort, and tormentil-roots, rendered slightly acid, by means of orange, lemon, or sorrel-juice, or vinegar. The chirurgical treatment is more immediate and effectual, and consists in scarifying and pricking the affected gums, and destroying their tender outer skin in such a manner, as to occasion a fresh shooting forth and elongation of their substance,

* Some practitioners are of a contrary opinion; particularly the ingenious Mr. March. Therefore I only offer this as the result of my own observation.

and such a solidity as will endure the usual impressions of mastication. When they have lost their connection with the teeth, or when they do not embrace them closely, cutting a small slip away from the forepart is of considerable service; for the new gum will then adhere to the tooth, or at least will embrace it more closely. During the time necessary for completing the cure in this manner, opiates, solution of camphor, or a few drops of the nitrous æther, in common spirits, may be used with due caution and in proper form, to mitigate or remove the tooth-ache.

I say, one or other of these may be used; but it is not easy to determine, any other way than by trial, which of them is best in any tooth-ache: for I have found opium extremely offensive in some pains of the teeth, which yielded to *camphor*, and *vice versa*, camphor has failed where *opium* has succeeded, without my being able to determine what is the cause of this variation.

A *recess* of the gums in scorbutic disorders is very frequent; but it is not often cured, when it has been of long duration, even although the scurvy which gave rise to it be entirely removed; because very few of the people who are thus affected look upon the complaint in the serious light that it deserves, nor have they patience enough to submit to repeated operations, however trifling, or to persevere long in any treatment which does not produce a visible change for the better in a very short time.

But if the patient will follow instructions punctually, and if the general disorder of the system be corrected by proper medicines, I think the surgeon dentist will seldom fail of success in cases of this kind.

A tradesman of this town applied to me about six months ago, desiring to have his teeth cleaned; and asked, at the same time, for some *tincture for curing the gums*, for his, he said, were going to decay.

I examined his mouth, and found the incisors of both jaws entirely naked to the very extremity of each root. After some discourse, I found he had been for many years troubled with the scurvy, but was lately cured by an eminent physician, who, amongst other things, ordered bathing at Margate. I told him that no tincture could cure him, but that if he would submit to the trouble of having his gums cut five or six times successively, and if he would use such washes as should be directed from time to time, I would do my best endeavors.

He was willing to follow my advice, and I immediately began with removing the tartarous crust which covered his teeth. I then scarified the gums near the edge in many places, and cut away entirely the weak skin which covered their extremities, to allow the fibres underneath to shoot forth more freely. After the

operation, I directed him to wash his mouth five or six times a day with a liquor composed of stimulating balsams, and to return in a few days. By this time his gums began to heal, but were not sensibly elongated; I therefore brushed his teeth clean again with a proper powder, and repeated the scarification, &c., as before. After this the gums began to extend themselves along the teeth; but the progress was so slow as to require the fifth or sixth operation, and the constant use of balsamic washes, which I changed occasionally to prevent disgust; and thus, at last, after a perseverance of six weeks, the gums were completely restored, and have remained sound ever since, by the assistance of astringent washes and brushing.

A recess of the gums occasioned by tartar is treated of in the next chapter.

CHAPTER VII.

Of Tartar of the Teeth, and the Recess of the Gums, and Tooth-ache occasioned by Tartarous Concretions long neglected.

In febrile disorders, and when the salivary liquor is not freely poured forth, as when we sleep, or when the neighboring muscles are not in action, we observe, that a sort of viscid yellowish substance is formed on the teeth, which most probably is at first nothing more than the saliva inspissated in different layers, and adhering to the *teeth particularly*, because their inelastic immovable substance gives it an opportunity of lodgment, and does not, like the softer parts, ooze out a moisture to destroy its consistence and adhesion.

This viscid matter is the bed in which tartarous or earthy particles rest themselves, whether collected from the salivary liquor or from the putrid reliques of food left between the teeth, or from both; it is soft and yellowish, sometimes of a dark brown, and disfigures the whiter and smoother enamel that lies underneath. When it is long neglected in this state, the daily access of fresh matter, and the continued dissipation of the more fluid parts, render it thicker and harder, and more intimately connect it with the enamel, so as at last to form, in a manner, one continued substance with it, and sometimes to acquire a solidity equal to stone.

The discoloring of the teeth and the deformity of them, are not the only evils that attend it; for in its progress it insinuates itself between the teeth and gums, brings on inflammations and pain, destroys their connections, generates fungi, ulcers, and flabbiness, occasions the gums to recede, and at last, by its constant pressure, brings them to waste and decay; in consequence of this, the

teeth are not well supported, and the air or acrid food are free to attack them below the enamelled part; whence tooth-aches, caries, looseness, and fetid breath often take their rise. All these evils are the fruits of sloth and negligence, for they are easily prevented, and, when recent, very speedily cured.

The preventive method shall be treated of hereafter, and the cure varies according to the degree of the complaint. For there are several sorts of tartar, differing remarkably in color, thickness, hardness, and adhesion from the soft slough that gathers over night, or in sickly people, to the large and stony substance which often envelopes in one uniform crust all the teeth of either jaw, together with a considerable part of the gums.

That soft matter which gathers on the teeth over night, is easily removed by brushing and washing them frequently, and freeing them carefully at night from the scraps of food which are apt to lodge after supper.

A slight discoloring of the enamel is removed by rubbing the teeth with certain testaceous powders, which are prepared for that purpose, and which do not grind away the enamel like those that are commonly sold under the name of *tooth powders*. But these are only to be used till the enamel is cleaned and polished, then to be repeated occasionally at proper intervals, when the daily use of a tooth-brush is not found sufficient to preserve the teeth from future tarnishing of the same kind, or when it has been neglected.

The *crumbling*, or the *hard scaly tartar*, is to be removed by means of particular instruments, which the surgeon dentists use, beginning at the gums, and raising it off in layers from the teeth: for when the tartarous matter is hard or thick, scraping is tedious and ineffectual: then, what the instrument has left behind, or the discoloring matter that still adheres to, and shades the beauty of the enamel, is to be removed by the use of harmless tooth-powders, as mentioned above.

The inflammation of the gums occasioned by tartar is often very violent, and requires to be treated with emollients, as in page 18. When they are depressed or decayed, their growth and adherence to the necks of the teeth is to be encouraged, after the removal of the tartar, by the methods related at page 25. But if the tartarous matter has so far insinuated itself between the teeth and gums, as to widen the openings which the gums form for the passage of the teeth, a small piece is to be cut away in the fore part of each; for without this, the gums will not closely embrace a tooth which has been made smaller at the collar by the removal of its tartar.

The treatment of the wounds after these operations is the same

as was delivered at page 21 ; and the pain attending this exposed condition of the teeth, whilst they are under cure, is palliated and relieved by camphorated opiate and spirituous washes, and sometimes most effectually by the application of peppermint-water, with a few drops of nitrous æther added to it.

Before we conclude this chapter, it is necessary to inform the reader, that the enamel in some people is discolored throughout its whole substance ; in which case, the removal of the tartar will only prevent diseases of the gums, but cannot impart whiteness to the teeth.

Without being apprised of this, some people, who are ill advised, continue the use of tooth-powders, electuaries, and tinctures, and scraping with instruments, long after the tartar is gone, and even until the *enamel* itself is quite destroyed. In consequence of which, they are affected with the slightest impressions of heat, cold, sweet-meats, acids, &c., and are very seldom free from the tooth-ache.

It is remarkable, that the generation of tartar depends as much (if not more) on the constitution of the patient, as on neglect, or rough enamel, or snagged teeth ; for whilst some people, without any care, have their teeth always smooth and free from tartar, others have it collected in great quantities ; and in a few, the generation of such stony matter is so quick, and in such quantities, as to exceed the belief of any person who is not particularly versant in this business.

A gentleman of the bank, not above twenty-three years of age, applied to me about a year ago for advice concerning his teeth, which he said were of a very uncommon kind, and gave him constant pain.

I found them perfectly buried in tartar, by which each set was united into one continued piece, without any distinction, to show the interstices of the teeth, or their figure or size. The stony crust projected a great way over the gums, on the inner side, as well as the outer, and pressed upon them so hard as to have given rise to the pain which he complained of. Its thickness at the upper surface was not less than half an inch, and the crust that covered the external side of the incisors of the lower jaw was so large as to throw the lip forward considerably.

As the teeth are easily affected by cold, after the removal of tartarous concretions of the ordinary thickness, and as a great deal of time would be necessary in this gentleman's case, I thought it safest and most convenient to scale away this uncommon quantity of tartar at proper intervals. I removed the whole in about a fortnight, taking off a little every day, and then with a brush dipped in tooth-powder, made them perfectly clean and

white. But they were naturally very far distant from each other, and the gums were considerably injured and forced away by the constant pressure of the tartarous crust ; I therefore scarified them in many places near the edge, and advised the patient to use the tooth-brush two or three times a day, to keep the teeth clean, and to encourage the rising and strengthening of the gums. In about ten or twelve days I perceived them so far restored, that I told him nothing more was to be done, except to keep the teeth clean for the future, and to brush the gums.

In the space of half a year he came to me again, and I found his teeth covered with a new crust of the former kind, as thick as a crown-piece. This was the more surprising, because he told me he had not neglected to brush his teeth as I had directed; I therefore thought it necessary, after having removed this second growth, to recommend to him the daily use of testaceous tooth-powders, and a harder brush.

This is not the only case of the kind which I have seen, but it is the most remarkable, on account of the age of the patient, and the quick regeneration of the stony matter.

The luxations of the teeth, and other evils occasioned by tartar, shall be considered in the next chapter.

CHAPTER VIII.

Of Looseness of the Teeth, Change of Position, Protrusion, Total Luxation, and the Tooth-ache arising from these causes.

A LOOSENESS of the teeth is occasioned by recess of the gums, or tartarous concretions, or violence, or by the withering and decay of the connecting membranes and vessels, as happens in certain disorders, and in old age. It is easily discovered by the touch ; and the cure is more or less difficult according to the degree of motion it admits of, and according to the nature of the causes which produce it.

When it is owing to a loss of gums, as in scorbutic, venereal, or putrid disorders, we must have recourse to the same general treatment as is mentioned in page 25 ; the loose teeth should be made fast and steady, by connecting them with the neighboring sound ones, by means of *gold wire* or *silken ligature* ; and care should be taken not to press on them for some time in mastication, or with the tongue. Astringent washes and brushing the gums should be continued long after they are renewed and healed ; and during the course of the cure, the tooth-ache, which may return from time to time, should be relieved by the use of sedatives, as mentioned before.

A looseness of the teeth is occasioned by *tartar*, when it insinuates itself between the teeth and gums, when it destroys their connection, extends along the roots, and, by pressing on the gums, brings them to decay.

Such a looseness may be easily distinguished by any person who knows what tartar is, and what evils it may produce; and it is cured by removing the tartar, by treating the gums as directed in page 25; by fastening the loose teeth by ligature; and lastly, the pain attending this sort of looseness and exposure of a tooth, is alleviated or removed by the sedative applications mentioned above.

When a tooth is loosened by violence, but not moved out of its socket, ligature alone, and astringent washes to brace the gums, are sufficient for the cure. In this case, the pain ceases with the looseness of the teeth; but if it be violent in the beginning, sedatives must be applied.

When the looseness of a tooth is owing to a decay of the connecting membranes, it can never be made perfectly fast; but by scarifying the gums, by the use of astringent gargles, by the help of judicious ligatures, and by avoiding all future violence or strong efforts in chewing with this part, such a tooth may be preserved tolerably firm and sound for many years.

A change of position of the teeth happens in various ways, as when they incline inwards, outwards, or to a side; or when they are turned round in their sockets, so that their edges stand across the line of the rest. It is the consequence of looseness, violence, or of the loss of a neighboring tooth.

When a tooth loses its natural position, without departing from the socket, in consequence of preceding looseness, it is to be reduced to order, and then retained steady in its proper place, by means of ligature, for some weeks; the cause of the looseness is to be removed, and the gums are to be braced round it by means of astringents. The nerve of the tooth is, in this case, generally broken off, and the tooth-ache which attends it, is owing to the pressure of the point of the root on the lacerated nerve at bottom; it should be pressed on, therefore, as little as possible; and if the uneasiness continues after it becomes pretty firm in the socket, a little of the top should be filed off, that the opposite tooth may not bear on it at all.

The same may be said of teeth which are pushed inward, or outward, or to a side, by violence.

The teeth that change their position, and incline to one side, in consequence of the loss of a neighboring one, may be brought back, or at least preserved from total luxation, by the interposition of an *artificial tooth*, which will support them, and, in process of

time, perfectly restore them to their former situation, provided it be well fitted in.

But if it appears that the inclination of two teeth towards a cavity is not likely to be attended with any looseness of them, some people are of opinion that it is best to let them take their bent, since it helps to fill up the void space, and since the neighboring ones may also be approached in like manner, by the help of ligatures, so as to leave little or no appearance of a lost tooth, after some months; but this is a practice which I do not think by any means advisable, for the interposition of an artificial one answers the purpose better for use and ornament.

The spongy, cancellated texture of the bone which forms the sockets of the teeth, and the vascular membrane or periosteum which covers their roots, gives rise to a particular sort of dislocation of the teeth, in certain circumstances.

It appears by experience that the pressure of the teeth against each other, in mastication, is the chief cause which retains them so long in their places; which prevents the spongy bones of the sockets from shooting forth their fibres, and filling up so small a cavity; and which counteracts the tendency which the periosteum, especially near the conical point of the root, must necessarily have to protrude the teeth, when its vessels are swelled or overcharged, from defluxion, inflammation, or otherwise.

Accordingly, in those who have lost a tooth, and where the corresponding tooth of the other jaw is thereby deprived of the usual pressure and resistance, we observe that this last very frequently rises above the common level, and is generally supposed to grow longer, until after some time the patient finds it less firmly fixed in the socket, and then is taught that it has been protruded from its natural bed. When a tooth has in this manner risen far above the level, and when by remaining so long, or by some slight injury, it becomes loose, the first care is to keep it fixed and immovable, by means of a ligature, for some weeks, and to use astringent gargles very frequently, until it becomes totally firm; then it is to be filed down lower than the level of the rest, to save it from further injury in mastication, and to prevent the pain, which in this case is felt severely whenever the patient chews, on account of the whole pressure of the jaw falling on the prominent tooth, and forcing its point violently against the distracted or torn nerve at bottom.

When a tooth is protruded beyond its due bounds, but still remains firm and immovable, the prominence should be filed down; but if the case is recent, and the protrusion not considerable, or an artificial tooth judiciously fixed in the opposite cavity, that is in the place of the lost tooth, gives such a counter-action and

pressure in mastication, as prevents this from becoming any farther prominent.

I know there are some people who object to the use of artificial teeth, as a sort of effeminacy and foppery. But if they are insensible of the disadvantages attending the loss of a tooth, in mastication, speech, and aspect, they ought surely to consider that, since an artificial tooth prevents the dislocation and loss of an opposite natural one, the practice is rational, and as interesting to a man who dreads deficiency or disease, as it is desirable to those who dread deformity.

By *luxation* of a tooth, I mean when it is raised partially, or totally from the bottom of its socket.

Luxation is preceded by long neglected looseness of the teeth, or is occasioned by violence; in either of which cases it is very rarely reduced or cured in this country, because it is not generally known to the people that such things are practicable; wherefore they pick out the tooth so luxated, and fling it away.

But the surgeon's art and long experience have taught, that a tooth, which has been partially or totally forced out of its socket, may be restored again to its former situation and firmness, and may serve for use and ornament to the latest period of life; provided the following cautions and instructions are duly attended to on the part of the operator, and also on the part of the patient.

With respect to the operator, he is to observe that, in a luxation which happens in consequence of long neglected looseness, or loss of gums, or old age, he is not to be hasty in attempting a reduction, or promising a cure; for a tooth which has been long loose has generally a short root, shallow socket, and bad gums; all which prevent its fastening well again; when the gums are lost, also, the reduced tooth seldom takes hold, or is well supported; and in old men the sockets fill up at bottom, the alveolar border shrinks away, the gums retire, and the teeth which are once luxated cannot therefore take hold at first, nor receive the necessary support afterwards. In these cases, therefore, I should prefer artificial teeth, before an attempt which promises no certain success.

It is also to be observed, that a reduction is only practicable in the fore teeth, whose roots are single; or in such of the molares as consist of straight conical roots, which will easily enter the bed from which they have been forced.

The cases where reduction may be practised with the greatest hopes of success are, when the patient is young, and where, in people of middle age, the gums are sound.

In young people a tooth which has been luxated, if instantly replaced, and forced quite to the bottom, need only to be secured

by a ligature for some weeks; and astringent applications are to be long continued and often repeated to brace the gums.

But when the same accident happens to a grown person, when the tooth is totally beat out, or when a surgeon is not at hand to reduce it in the very instant the swelling of the vessels and extravasated blood prevent its sinking so deep as before; and as a prominence above the rest of the teeth would expose it to future injury and pain, it is found necessary to cut off a little piece of the point of the root, to smooth it well, to fill the hole in which the nerve formerly lodged with lead or gold; then to reduce it carefully, and fasten it to the neighboring teeth by a golden wire or silken ligature; and the gums are to be treated as at page 25.

For people advanced in years, a hole should be drilled through the tooth sideways, close by the edge of the gums, before it is replaced; through which the gold wire or silken ligature should be passed, to secure the tooth more perfectly.

When the teeth have stood very close together, it is generally necessary to file that which is to be replaced, on the sides, that it may more readily enter the vacancy.

In this manner also, such teeth as have been extracted by the dentist, may sometimes be reduced with success; nor does it imply any error in practice to take out a tooth, and then to replace it; for a tooth-ache often arises from a caries and disorder of the nerve; which last must be destroyed before any relief can be obtained. This, in the case before us, can only be effected by extraction: the carious part is then to be filed away, or, if the tooth be hollow, it is to be scraped clean, to be prepared as above, then filled with gold, lead, &c., and replaced as soon as possible in the manner related above, after having first cleared away the grumous blood which may have lodged in the socket.

But after all that has been said on this subject, I think it necessary to add, for the sake of undissembled truth, and to prevent the imputation of countenancing the impositions which occur every day, that the success on all these occasions, however sufficient to justify the future trials and practice of honest and judicious people, is by no means equal to the extravagant assertions and promises of certain advertising imposters. In the most favorable circumstances, it is more than an equal chance, that a tooth once extracted or beat out never will fasten again.

Of all those that I have seen reduced, or that I have reduced myself, the greatest part are so far from adhering firmly, that they can easily be pulled out with the fingers; the patient can very seldom bear to chew with them; and even where reduced teeth have lasted firm for many years, I am of opinion, that it has been owing to the exactness with which they fitted their sockets,

together with the firmness of the gums, and not to any renewed connection with the periosteum or bone of the jaw.

It is also proper to observe, that teeth so replaced, often create intolerable uneasiness, pains, and inflammation; for which reason I do not recommend such methods to be frequently or indiscriminately tried, nor do I often use them in my own practice; although I know there are people who make such business well worth their attention, and to whose care I recommend some patients, who are determined on the trial, even although I refuse to be concerned.

The tooth-ache which attends luxations is of the inflammatory kind, or is owing to exposure of the nerve; the first sort is to be treated as mentioned at page 18, and 23; the last is relieved by the use of sedatives.

Now if this be admitted as a candid declaration of the truth, and as the language of a man whose interest it is to conceal the imperfections and failures of his art; if a tooth just extracted, and instantly replaced in a socket, which it fits in a manner no art can equal, fails of taking hold, more frequently than it succeeds, and generally is attended with uneasiness and pain, if not with violent inflammation; what shall we say of those who pretend to supply one man with the teeth of another, with teeth which cannot fit properly once in a hundred trials; which must necessarily press on the socket unequally, and therefore occasion inevitable pain and inflammation?

The few instances in which they succeed, surely are not sufficient to counterbalance the hazard; and were these people properly versed in the dentist's art, they would certainly prefer the healing of the socket, and the use of a well-constructed artificial tooth, or a human tooth with the root filed off, and formed to fit the void space exactly: for this will occasion none of the evils that attend the former practice, which is not only precarious, ineffectual, and dangerous in general, but also immoderately expensive; for it is not to be supposed, that any young person will sell a handsome sound tooth, to be torn out of his head, without being extremely well paid for his loss and pain.

In many instances where this transplanting of teeth has been thought to have succeeded, I am well convinced, that a new crown has been grafted on the old root, or the extracted tooth has been replaced, as related above; and the patient has been made to believe that a new tooth, extracted from another person for the purpose, is placed and made to adhere in this manner. Instances of both sorts of deception have more than once fallen under my own observation.

CHAPTER IX.

Of Fractures of the Alveolar Part of the Jaw-Bones, of sharp Splinters, of Portions of the Roots of the teeth left behind in Extraction, of Bruises and Lacerations of the Gums, and of the Tooth-ache arising from these causes.

THE dexterity of those gentlemen who brag how they can whip out a tooth quicker than other men can look at it, would be worthy of imitation, were it not frequently attended with the extraction of teeth whose disorders might easily be cured; or with the loss of many sound ones, by hasty mistaken application of the instrument; or with one or more of the other evils enumerated at the head of this chapter.

It happens, likewise, that the instruments which are most easily applied, and most frequently used by the tooth-drawers, are also those which act in the most disadvantageous manner, and whose chief power is exerted in breaking the external side of the socket, and in bruising and tearing the gums, instead of fairly raising the tooth upwards.

Under these inconveniences, the sudden exertion of the operator's force to jerk out the tooth in an instant, acts pretty nearly in the same manner as a smart side blow of a hammer would do; that is, it knocks out the tooth, but does not draw it safely.

The itinerant mountebanks, who affect this sort of dexterity still more than the barbers or common tooth-drawers, are not contented with resting here; for they not only whip out a tooth *before the patient can look about him*, but they endeavor also to make the people believe that they do it without an instrument, or by *conjunction*; and for this purpose, they are obliged to use such instruments as are most easily concealed in the hand, rather than those which are safest for the patient.

To these causes chiefly we may refer the frequent instances of fractures of the socket, and even of large portions of the more solid part of the jaw-bone, together with the various evils enumerated in this chapter.

If the fractured part be considerable, and not torn from its connection with the gums, it should be replaced immediately, and retained in its proper situation by means of a compress fixed between it and the cheek, after having been dipt in some mild balsamic tincture. If the fractured piece is already torn a good deal from its connexion with the gums, it must be entirely removed, the gums are to be replaced, and the wound dressed as above. But if the fracture is not large, the only care is to remove

any splinters which point outwards, or threaten to offend the healing gums.

As a tooth sometimes adheres and grows to the socket, so as to form one continued piece with it, it is necessary to observe, that a fracture, in that case, is not the fault of the operator. When it happens also, that a hidden caries of the jaw-bone has given rise to a tooth-ache, and, when close by the affected part, a tooth is extracted, the operator is not to be blamed, if a large piece of carious bone comes away: for here the fracture is inevitable, and instead of being hurtful, is the only effectual step towards a complete cure.

After slight fractures of the edge of the socket, if the operator has neglected to remove the sharp pointed splinters which are raised, the gums grow over them, and being constantly wounded by them, are exposed to inflammation and pain, which never cease until the splinters have been suppured away, or until the surgeon removes them with his instruments. The pain in this case has often been referred to some fault of the neighboring teeth, many of which have been extracted before the real cause has been found out.

The same errors in the choice of instruments, and in the hasty empirical use of them, are the most frequent causes, that a part of the root is left behind in extraction; and, I believe, that with the oblique power of some instruments, and the sudden snap given by the tooth-drawer, a tooth would very seldom come out unfractured, were it not for the soft yielding external edge of the socket.

The tooth-ache arising from a portion of the root left behind, is most effectually and instantly relieved by extracting the stump.

If the patient is unwilling to try this second operation, the pain may be sometimes removed by burning the nerve, or by applying a very small bit of lint dipped in essential oil of cinnamon over the hollow part of the stump, or by introducing a bit of paste made of opium, camphor, and essential oil of peppermint.

These sedative palliative applications very frequently answer extremely well; and it is on this principle that some people in town make considerable sums of money by curing the tooth-ache, by means of pretended nostrums or secrets, and that they all can produce many testimonies of their success.

Whether the nerve be destroyed by fire, or acrid liquors, or deprived of its sensation by sedatives, the root, losing its connections with the socket, is, after a little time, protruded and loosened, and then very easily extracted.

Indeed, a stump or the root of a tooth is at all times easily taken out, unless it grows to the jaw-bone, which is a very rare

case; and nothing is more erroneous than the popular notion that stumps are very difficult to be removed, and that digging and punching (as they call it) are absolutely necessary.

Whoever, therefore, assumes an operation of this kind as his chief excellence, pays a very miserable compliment to his own understanding, and insults the judgment of the people, by offering to them, as a matter of great importance, what scarce requires common sense.

When the gums are caught between the heel of the instrument which is commonly used, and the tooth that is to be extracted, they are frequently bruised and torn; and in fractures of the jaw-bone the wounds of the gums are often very large. The socket in either of these cases does not heal so soon as usual, the parts inflame, and sometimes suppurate; the nerve at bottom, and the naked roots of the neighboring teeth, are exposed to the air and other injuries, at the time when they are most susceptible of irritation, pain, obstruction, and caries.

The method of cure consists in replacing the gums, in removing the inflammation, in disposing the part to heal, in preserving it from external air and the relicks of food, in mitigating the pain, and lastly, in the use of astringents; all which have been treated of and explained in various parts of the preceding chapters. It is not surprising, that a troublesome hæmorrhage should sometimes follow fractures of the jaw-bone, or deep wounds of its periosteum and gums, or even the simple extraction of a tooth. For if in any of these cases a few arteries are cut off, close by the surface of the bony canal in which they pass, and to whose circumference they are immovably connected, they cannot shrink and close, to stop the blood like the elastic contractile vessels of the muscular parts, but must continue to pour it forth in a constant undiminished stream; and all the idle compositions, styptics, and astringents, generally applied, can avail nothing, where the parts are not at liberty to follow such impressions.

An hæmorrhage from simple extraction of a tooth is most effectually stopped by filling the socket with lint, agaric, sponge, or cork; then by placing narrow compresses over it, until the whole exceeds the level of the neighboring teeth; and lastly, by ordering the patient to approach his jaws, and press the dressings tight into the socket.

An hæmorrhage from wounds of the gums or periosteum is not dangerous or lasting, and only requires styptic applications, such as alum water, spirits of wine, &c. An hæmorrhage from a small fracture of the jaw-bone I have seen very troublesome and very lasting on some occasions, whilst, in other instances, large fractures have been attended with very little loss of blood, as happened in the following case:

About five years ago a young woman, aged twenty-three, went to a certain barber-dentist in this town to have the last molaris of the upper jaw on the right side taken out, on account of a violent tooth-ache which it occasioned. He applied his instrument with great agility, and made a strong effort to extract the tooth, but to no purpose. Uneasy at the disappointment, he intreated the patient to allow him a second trial, promising that he should certainly succeed with another instrument. She at last consented; he fixed his instrument, and with a sudden exertion of all his strength, he brought away the affected tooth, together with a piece of the jaw-bone as big as a walnut, and three neighboring molares.

The violent distension of the muscles of the jaw on this occasion brought on immediately a great soreness and inflammation of them, and this, joined to the inflammation arising from the fracture and laceration, extended to the muscles that serve for deglutition, to such a degree, that two hours after the operation she could hardly swallow.

But the inflammation and pain were not so dreadful to the patient as the deformity which was likely to ensue: she consulted her friends; I was sent for, in the absence of Mr. Green, and having waited on her immediately, I received the history of this affair in about three hours after it happened, just as I have related it.

After looking at the wound, and examining *the piece* which was broken off, I told her, that nothing could be done, except to encourage the growth of the gums over the fractured bone; and, after the healing of the parts, to fill up the void space with an artificial piece, to support the cheek and prevent the lodgment of the food in mastication. Upon this her friends seemed to be greatly disappointed in their expectations; they asked whether there did not remain some possibility of replacing the teeth? and, indeed, I believe they sent for me with that hope. I answered, that I thought it impossible in her case, but that it would be well done to consult a surgeon of eminence on the occasion. They acquiesced, however, in my opinion, and desired I should attend her.

The violent inflammation of her throat and face made it necessary to order bleeding and purgatives immediately, by means of which and nitrous draughts, these symptoms were removed in less than three days. The wound, I dressed, and filled with compresses in the manner related above, under the article of fractures, and the part was healed in about a month; during which, time nothing remarkable happened, except the flow of mucus from the maxillary sinus during the first ten days, which gave the dressings and the matter of the wound an uncommon appearance.

The young woman after this would not admit of an artificial piece, and she still feels a difficulty in swallowing.

When splinters are raised in the extraction of a tooth, they generally fall away of their own accord, or, by the immediate and constant uneasiness which they occasion, they direct the patient to have them removed by the surgeon. But sometimes it happens otherwise, and they give no great trouble until the parts happen to be pressed on and wounded by their sharp points, a particular instance of which I have seen, and I think is not unworthy of observation.

A gentleman, who had the second dens molaris of the upper jaw on the left side extracted by a *tooth-drawer* in this town, about two years ago, happened lately to strike his cheek slightly against a chimney-piece. In some hours after he felt a throbbing pain in the gums, just over the place where the tooth which had been extracted, formerly stood. Next day the pain extended to the neighboring teeth, and became violent; in consequence of which he called on me, and desired that I should either take out a tooth, or do whatever else I should judge necessary to remove the pain. I found his teeth perfectly sound; and although the inflammation was not confined to any particular spot, I observed it most considerable and most prominent in the place above-mentioned. As the stroke which he received was too slight to occasion such appearances, were the parts not faulty before, I immediately concluded, that some splinters had been formerly raised, which pointing against the gums had wounded them on this occasion: I therefore made a crucial incision to the bone, and having found the splinter, which I before suspected to be there, I cut it away with a proper mouth-fleam, after which the patient complained of pain no longer, and the wound healed without any application.

CHAPTER X.

Of the Tooth-ache occasioned by excessive cold air, and the sudden alternation of hot and cold liquors.

THE tooth-ache arising from either of these causes is seldom violent or durable in this country, except with delicate women, who live a sedentary recluse life, and with those who injure the enamel by the use of tinctures, electuaries, or powders, or by admitting the use of the file too freely.

Such a tooth-ache is easily distinguished, because the patient always knows and tells the cause: and it is cured by keeping the mouth filled as long as possible with warm water, or *spirituous peppermint water*; or, if that is not at hand, with any *ardent spirit*.

CHAPTER XI.

Of the Sympathetic Tooth-ache.

WHOEVER is acquainted with the pathology of our system, will not be surprised that a rotten or disordered tooth should produce a violent pain in a sound one on the opposite side, or even in the corresponding one of the opposite jaw. For it is well known that a caries of a tooth, in some people, constantly produces a violent aching at the ear; that irritation of the nose brings particular muscles, which lie very distant, into convulsive action; that an inflammation of the diaphragm produces a pain in the tip of the shoulder; that certain irritations of the stomach bring on a pain in the head; in short, an infinite number of such *sympathetic affections* occur every day.

This sort of tooth-ache must necessarily have occasioned the loss of many a sound tooth with the *dexterous* tooth-drawers, who generally apply the instrument to the tooth pointed at by the patient, and make a merit of whipping it out *before he knows where he is*, as they express it. And I am the more confirmed in this opinion, not only by the instances of such mistaken practice which have fallen under my own observation, but also by two cases, in which, through the obstinacy of the parties, I was forced to draw sound teeth contrary to my advice and inclination.

If the operator is not extremely careless and ignorant, a tooth-ache arising from sympathy is easily distinguished, by observing that the pained tooth looks sound and well, at the same time that there is a disordered one somewhere in the same jaw, or in the corresponding part of the opposite jaw.

The disease of the faulty tooth is generally caries or hollowness, which is to be treated with filing, burning, cleaning, acrid, camphorated, or sedative applications, or filling with lead or gold, as circumstances require.

But if these methods do not avail, and if the pain of the sound tooth continues, the disordered one must be extracted; for it is remarkable that the mechanism by which pain is conveyed from a carious tooth to a distant sound one, serves also to communicate caries and decay, unless the original cause is removed in due time.

A tooth-ache which arises from inflammation, or other general disease of the parts immediately contiguous, is treated of under these heads respectively, and does not require particular consideration, because it is not so singular, nor so easily mistaken, as that which we have just now mentioned.

CHAPTER XII.

Of Matter collected in the Maxillary Sinuses, and sometimes in the Cancellated Substance of the lower jaw, and the Tooth-ache arising therefrom.

THE bones which compose the *alveolar arch* of the upper jaw, form, by their connection with other bones of the head, certain cavities, called the *maxillary sinuses*; these are lined with a vascular and glandular membrane, and they contain a sort of mucus, which passes off by the nose.

The membranous lining of these cavities is subject to inflammation, defluxion, or suppuration, like other parts; and the matter so generated, when it is long retained, and becomes acrid, produces erosion of the neighboring bones, and violent pains, which the patient calls tooth-ache, because the seat of pain is close at the roots of the teeth.

This tooth-ache may be distinguished from others by the following signs:

As the matter formed is preceded by inflammation, tension, and pain of the membranous sack, the disease begins with a deep-seated, throbbing pain, more or less violent, in the affected parts; then, after some time, a lasting, gnawing pain is felt, as it were at the roots of the neighboring teeth, attended often with a pain in the orbit of the eye, and in the ear. Those, also, who have ever experienced the common tooth-ache, can easily perceive that this is of a very different kind, that it is more constant, and less subject to increase or decrease from any impressions made by cold or heat, or medicines applied in the mouth. The only method of curing this sort of tooth-ache, is by drawing a tooth immediately under the affected part, and then by piercing through the bottom of the socket into the *sinus* or *antrum maxillare*, with a triangular pointed instrument, so as to give a free vent to the corrupted matter. After this, balsamic, spirituous and detergent injections are to be thrown in daily, to wash away whatever may remain, and to promote a laudable suppuration for some days, until the cessation of pain and good appearance of the matter show that *nature* can do the rest. In the mean time a little lint, wetted in any mild balsam, should be kept in the socket to prevent the access of external air.

A laboring man of a good constitution, and about forty years of age, happened in a quarrel to receive a violent blow on the right side of his upper jaw, close by the nose and mouth. A considerable inflammation, attended with a throbbing pain in this part, and a slight fever, immediately ensued; in seven or eight days, ulcers were formed between the bone and integuments, and

matter began to be collected in the maxillary cavities, producing deep-seated, gnawing, incessant pains. He applied to a surgeon, but the methods pursued did not at all check the disease; for the purulent sinuses every day gained ground, extending under the gums on all sides, under the muscles which cover the maxillary bone, and into the cavity of the nose; so that the matter would gush out at the right nostril when the cheek was pressed on, and a little of it oozed away from some small openings in the gums. The gentleman who attended him in this unhappy state, recommended him, about a year ago, to an eminent surgeon for farther advice.

He immediately discovered the true cause and state of the disorder; he was pleased to send for me, and it was judged necessary to draw one or two of the molares, first of all. This was done with so much ease, that I suspected the jaw-bone to be carious; and as a large opening would be necessary for the exfoliation of the bone, and the discharge of the matter from so many various parts, I resolved to draw a third molaris, before I made any opening through the bottoms of the sockets, into the maxillary sinus. But in the extraction of this tooth, all further trouble was prevented; for a large piece of the alveolar part of the bone came away with it, and a large opening was made into the maxillary cavities, from whence two or three spoonful of matter poured down immediately, so fetid that the stench was hardly to be borne.

A vent being thus given to the matter which lodged between the soft parts and the maxillary bone, as well as to that which was collected in the maxillary sinuses, the drain was so considerable for ten or twelve days, that it reduced the patient to the last extremity; for he had been long before emaciated and worn down by a hectic fever, and the little strength that remained was scarcely sufficient for the discharge on this occasion. Yet after all, by the humanity and good care of the gentleman who attended him, and by a treatment similar to what I have recommended above, he recovered perfectly in the space of two months. Had this patient been well advised at first, the matter would have drained away freely, and the disease could scarce have lasted ten days.

As the maxillary cavities communicate with the nose, and cannot, therefore, be looked on as having no communication with the air, it is surprising how long purulent matter lodges in them, sometimes, without acquiring acrimony enough to destroy the bones.

About two months ago, a middle-aged lady, who had tried all the nostrums which are advertised for curing tooth-aches, called on me for advice concerning a violent pain which she had felt for

three or four months past, in a greater or less degree, in all the grinders of the upper jaw on the left side. She added, at the same time, that she was sure her teeth were sound, and therefore would not permit any of them to be drawn.

After looking into her mouth, and considering her case in all its circumstances, many of which I now omit for the sake of brevity, I was obliged to tell her that, unless she consented to have a tooth drawn directly, the extraction of two or three might not be sufficient after some time. When I had explained to her the nature of her case, and thus represented the danger of delay, she submitted readily. I drew a first molaris and with a *graver* pierced through the bone at the bottom of the socket, into the maxillary sinus. A small quantity of matter issued forth; I injected a little tincture of myrrh and aloes with a syringe, then stopped up the socket gently with small, soft compresses, which were renewed for three or four days, after which no farther care was necessary.

Hence it appears that collections of matter in the maxillary sinuses should be removed in due time; and it is in general better to be hasty on this occasion, and to submit to the loss of a tooth, rather than by tampering and dalliance, to risk the health and life of the patient.

But on the other hand, we should not forget that nature sometimes brings unexpected cures; and our being hastily bent on operations and expeditious means, should not make us inattentive to the efforts and appearances which promise a change for the better, without any assistance of art.

I have seen a case, in which, after all the usual symptoms, the matter had passed away by the nose, occasioning a disagreeable smell, and staining the handkerchief; and it is not impossible but that matter thus collected may sometimes be reabsorbed and carried into the circulation.

Collections of matter in the cancellated substance of the lower jaw happen very rarely from any internal cause, but frequently arise from topical diseases of the neighboring parts, which have been ill treated, or long neglected. In ulcers of the gums, *caries*, and *purulent hollowness of the teeth*, and such like cases, if the acrid matter is permitted to lodge a long time on the bone or in the socket, erosions, deep cavities, and destruction of the osseous substance must necessarily follow.

The symptoms in this case are similar to the former, and the cure is obvious from what has been said above.

CHAPTER XIII.

Of a Caries and Exostosis of the Bones which form the Sockets.

THE bones which form the jaws are subject to caries and exostosis, like those of other parts, and the pains which accompany these disorders, as they are extended to the teeth, are often complained of under the name of tooth-ache.

The exostosis is easily discovered by any person who knows that a tooth-ache may arise from such a cause; because the teeth to which the patient refers the pain, are sufficiently sound, and the jaw-bone, somewhere near at hand, discovers to the touch and to the eye, a protuberance, which, by overstretching the periosteum, is the cause of pain.

People who are not instructed in the nature and differences of disorders which produce a tooth-ache, are easily deceived in a case of this kind; and their error is seldom discovered before the patient has a great number of his teeth extracted successively, with the groundless hopes of being relieved of pain. But neither extraction, opiates, or external applications can avail. The soft parts which lie over the exostosis must be divided quite to the bone by a crucial incision; the exostosis is then to be cut away with a knife, or cautery, or broken with pliers, and the wound to be treated as is commonly practised by the surgeons, in cases where a bone is exposed.

When an exostosis of the jaw-bone produces pain, which is only felt in the part affected, and is not extended to the teeth in such a degree as to make the patient call it tooth-ache, it often happens that the protuberance is taken for a disease of the gum, and it is consequently treated with emollients, &c., *to bring it to a head*, as they term it; by which means it acquires fresh growth every day, and at last compels the patient to seek better advice, after having been tired with long repeated unsuccessful applications and nostrums.

A case of this kind very lately fell under my care, in which the pain ceased immediately after the incision of the gums and removal of the exostosis, and the part was healed in less than six weeks, although the exostosis frequently attempted to rise again during the first three weeks.

A caries of the jaw-bone occasioned by the lodgment of acrid matter, generated originally in the sockets, or in ulcerated cavities of the gums, has been treated of in the twelfth chapter. Here I mean that sort of caries which seems to begin in the *substance* of the bone, or at least in the periosteum, and destroys these parts, before any aperture or matter can be discovered externally.

This disorder is known by the incessant gnawing, deep-seated

pain that attends it, and by the constant inflammation of the soft parts that lie over it, which in process of time brings on lividity and ulceration.

The soft parts are to be divided by a crucial incision, and the bone is to be laid bare in this case as well as in the former. The carious crust should be pierced in many places quite through, until the instrument meets the sound bone: an exfoliation is then to be promoted, and the wound in due time is to be healed in the manner commonly practised by surgeons, after which the pain and tooth-ache cease of course.

From these two cases, and many others mentioned in this little treatise, the reader may easily perceive the absurdity and fallacy of pretending to cure every tooth-ache by means of *external applications*. He may observe, that we do not fail to recommend them, under the name of *palliatives*, where they are likely to succeed; but on the other hand, it is evident beyond all contradiction, that by far the greater number of tooth-aches cannot be relieved by such treatment, and some of them may become dangerous to the health and life of the patient, if *that time* be spent in fruitless tampering with *nostrums*, which should have been employed in preventing the progress of the original disorder.

These remarks are peculiarly applicable to that kind of caries of the jaw-bone which attends venereal infection long neglected, and the abuse of mercury; because the pain felt on these occasions is generally referred to the turgid and ulcerated state of the gums and periosteum, and very little inquiry is made to determine when it arises from less frequent and less suspected causes. In consequence of this, palliative and topical applications only are used, and the true source of pain is left undisturbed, until the rottenness and decay are so considerably extended, as to destroy the whole alveolar part, and thus to rob the patient of all his teeth, if not to put a painful period to his life.

A gentleman about forty-five years of age, who is now under the care of an eminent surgeon, whose friendship I have often experienced, was pleased to send for me some time ago to have advice concerning his teeth and gums, which he said had been long extremely painful and disordered, in spite of a variety of applications which he had tried under different people.

I found the gums and contiguous periosteum of the lower jaw entirely destroyed, the teeth discolored, and surrounded with fetid matter. The upper jaw was also affected, but not to so great a degree.

The long duration of the disease, the state of the soft parts, the removal of the seat of pain from the teeth to the solid part of the jaw-bone, and the color of the naked alveolar part, showed evidently that this last was carious.

Determined by these appearances, and by the judicious advice of the gentleman above mentioned, I applied my instrument to extract the third grinder, which stood in the most disordered part of the bone. It came away with great ease, and brought with it a large piece of the carious bone, together with four teeth which it enclosed. The part is now almost healed, under the care of the surgeon to whom he is entirely indebted for this cure; but it is to be feared, that another operation of the same kind will be necessary on the opposite side, through the patient's neglect, in permitting the caries to extend itself so far before he called for proper advice.

Indeed, I believe, that if this case had fallen under skilful hands at its first rise, an incision of the gums and puncture of the affected bone, or at the worst, the extraction of one tooth, would have put an end to the disease, provided the venereal infection had been judiciously treated at the same time.

CHAPTER XIV.

A Caries of the Teeth, and the Tooth-ache arising therefrom.

A *beginning caries* is discovered by spots of a dead white, or yellow, or brownish hue, accompanied generally with slight fissures and perforations of the enamel; a more advanced stage of it is shown by a lividity or superficial blackness: and the last degree of it, by loss of substance.

Exclusive of the different stages of the disease, it is to be distinguished also by the manner in which it proceeds, and the part of the tooth which it attacks; for it sometimes destroys the teeth quickly, with a wet and livid rottenness, and is then called a *wet caries*: at other times it acts more slowly, and the affected part is yellow, dried, and withered; then it is called the *dry caries*.

The former sort affects a tooth in the middle of its upper surface *most commonly*, and proceeds quickly to the cavity in which the body of the nerve lodges: the other attacks it laterally, gives less pain, acts more slowly, does not happen so often, and is more easily checked in its progress.

The molares, on account of their grinding on each other in mastication, lose the enamel of their upper surface before any of the other teeth; and therefore are much more frequently affected with that sort of caries which perforates the teeth perpendicularly, exposes the nerve and vessels, gives rise sometimes to fungus excrescences of them, which some people have mistaken for worms of the teeth, and occasions that constant oozing of fetid matter from the exposed vessels, which distinguishes the *wet caries*.

It is remarkable, that the upper molares are more frequently carious than the lower, and the *dentes sapientiae* in general suffer sooner than any of the other grinding teeth.

Fissures, perforations, and white or yellow spots of the enamel, should not be meddled with; for teeth are very often seen to last in such a state for many years, without any of the inconveniences which attend the total exposure of the bony substance when the enamel is filed away: but when it happens that this affection of the enamel makes hasty strides towards lividity and true caries, then it is to be treated in the manner related hereafter.

A superficial or dry caries, if it does not appear to advance very quickly, should not be meddled with, because it cannot be removed without destroying the enamel, and because such a cure is often productive of greater evils than the disease itself; for it exposes the bony part of the tooth, and gives rise to pain and new disorders on every slight occasion; whilst the superficial caries, if left to itself, might remain without increase or inconvenience for many years, as we frequently observe.

Sometimes, however, it proceeds quickly to destroy the substance of the affected tooth, and must be filed away totally. Then the bony surface, which is exposed by the operation, is to be covered with a bit of lint dipt in a stimulating balsam, or if this cannot be conveniently applied, with a bit of gum tacamahaca, gum juniper, ambergris, or of gum mastich, properly fastened in.

At other times it attacks the whole crown of a tooth on all sides, particularly when the enamel is worn or filed off; and although it does not waste it very fast, it renders it incapable of bearing the slightest pressure or cold.

Aerid, aromatic, camphorated, and sedative applications remove, *for the instant*, the pain which is felt occasionally; but if it should return often and violently, and if the extreme sensibility of the affected teeth prevents the patient constantly from chewing on that side, extraction is by all means advisable, else the neighboring teeth will become tartarous and protruded for want of use.

When the *wet* or *livid caries* attacks the upper surface of a tooth, it should be immediately removed by proper instruments: if it has already made its way into the cavity, in which the body of the nerve and the vessels lodge, and occasions violent pain, the nerve should be destroyed, by applying the *hot iron* which is made for this purpose: a little lint, dipt in *oil of cinnamon*, should then be placed in the cavity for two or three days, to shrivel such part of the nerve at bottom as might have escaped the iron, and to correct the putrefactive liquor; after which, the burnt and carious parts are to be cleared away, the hole is to be widened a little, *if necessary*, and then filled with gold or lead, &c.

For those who dread the actual cautery, and will not submit to it, a drop of spirit of vitriol or nitre may be catched on the end of a probe, and introduced carefully into the cavity: a drop of soap-lees, or a bit of lunar, or common dry caustic, will answer the same purpose; but none of them so well as the actual cautery; because their action cannot be so easily or so immediately directed, nor can the saliva be prevented from blunting their corrosive quality. When the pain is already violent, and when the actual cautery cannot be used, oil of cinnamon, or of cloves, applied in the cavity, shrivels and destroys the nerve more gently and slowly than caustic applications, and after some days, suppresses its sensibility so far as to admit the use of instruments to clear away the carious parts, to widen the cavity, and to fill it with gold or lead, to prevent the future access of air, the lodgment of food, and the farther progress of the disease.

Wherever gold or lead cannot be borne in this manner, some of the tough resinous substances, mentioned above, should be used, until the parts are less sensible, or better accustomed to such a sensation; and it is in general to be observed, that the gold, lead, or gum, should not project beyond the *common level*.

When the caries has been neglected until the bony substance of the crown is almost destroyed, the remaining enamelled shell is to be filed down even with the gums; and the *crown* of a human tooth of proper *shape* and *size* may be artfully fitted over the natural stump, and screwed to it, in a manner to be as solid and useful as any of the other teeth.

This is a method which can be attended with no manner of inconvenience, provided it be properly executed, in the manner practised by the *ingenious* Mr. March, provided the nerve be destroyed, that the screw do not enter too deep into the root, and that the root itself be not already loosened. Therefore I always practise it, and prefer it to the extraction of the stump, and the precarious transplanting of another tooth, whenever the patient is willing to go to the price which a judicious execution of it deserves.

I observe, that some people, endeavoring to imitate this method, use a rivet instead of a screw, and make the patient believe that they have instantly given him a beautiful and well-fastened tooth, whilst they have only fitted a new crown to the former stump. But the rivet is not eligible, because it does not hold so well.

When it happens that the nerve cannot be perfectly destroyed, and the screw cannot be borne without pain; the crown, which is to be fitted in, is to be drilled through laterally almost even with the gums, and, after being properly placed, is to be held fast by means of ligatures, which are to be passed through these holes, and fixed to the neighboring teeth.

A caries sometimes affects the teeth, and produces the tooth-ache in a manner which cannot easily be discovered: that is, it begins in the lateral part of a tooth, where it is perfectly hidden and covered by the neighboring one.

This sort of caries often proceeds quickly, and considerably injures the teeth before it appears externally; therefore it should be carefully looked into, and obviated in due time by filing open the suspected part, and by removing entirely the infected crust. For although it is advisable to be very sparing and cautious in the use of the *file* in every other instance, this case particularly requires it, without loss of time; that the putrid and contagious matter may have no place to rest in, that it may not affect the neighboring teeth, and that there may be room for the brush or tooth-pick to enter and clear away the relics of food, which considerably promote the carious infection.

As a caries may easily be communicated from one tooth to another, and often makes considerable advances without occasioning any pain, those who are nice in the preservation of their teeth, should have them examined three or four times a-year at least; because in that case, the surgeon dentist may nip such evils in their rise, or he may judge more accurately of the nature and due treatment of each.

Where it happens that a patient is led away with the opinion that the tooth-ache attending caries may be cured by external applications, as advertised by many persons; and when he will not submit to the rational and effectual methods treated of above, we must be content with the application of sedative and camphorated pastes or tinctures to the carious part, or with the use of oil of cinnamon, or of cloves, or of spirits of turpentine, or any aromatic acrid liquor, to destroy the sensation of the nerve for the instant. Finally, where the caries has extended too far into the substance of the root, where matter is generated and likely to be retained in such cavities, where a new crown cannot be fitted, and where the pain continues even after the nerve is burnt, *extraction* is the last resource.

CHAPTER XV.

Of the Loss of Enamel, and the Tooth-ache arising from thence.

A loss of enamel is easily detected by the eye, and is occasioned sometimes by internal disorders, sometimes by acid fruits and sweetmeats, often by long wearing, but most frequently by filing and the repeated use of certain tooth-powders, electuaries, and acid tinctures, sold for cleaning the teeth.

Whatever the cause be, the enamel once lost, as we mentioned before, never is restored, and all that can be done for the tooth-ache, arising from such an exposure of the naked nervous bony substance of the teeth, is to use palliatives, or apply the instrument at once. For the former intention, camphorated ætherial and sedative applications, if properly chosen, may be used as a temporary relief with success: at the same time also, the use of such cutting powders and corrosive tinctures must be wholly rejected, and extremes of heat or cold, and sweetmeats, and acid liquors, avoided carefully, for reasons which shall be treated of at large in the third part of this work.

CHAPTER XVI.

Of Fractures of the Teeth, and the Tooth-ache arising from thence.

As the fracture of a tooth is occasioned by some violence, and attended with a loss of substance, it is easy to know when a tooth-ache arises from that cause.

The treatment depends on the extent, the direction, and figure of the fracture, on the symptoms which attend it, and on the choice and circumstances of the patient.

If the portion of the tooth that is broken off be small, acrid oils, sedatives, and camphorated applications, remove the sensibility of the exposed bony substance, and mitigate the pain, until custom, or the withering of the nerves which lie near the surface, renders the ordinary impressions of air, cold, and heat, tolerable to the patient; it is also advisable to cover the part for some time with some of the resinous substances mentioned before.

If the fracture be oblique, leaving sharp prominent edges which are likely to wound the lips or tongue, they are to be filed off.

When the whole or the greatest part of the crown is broken off, the nerve is to be destroyed, and a new crown fixed on, as related at page 49. If the patient does not choose the expense and trouble of this method, and if he feels no pain or uneasiness from the stump, it may be safely permitted to drop out of its own accord. But if the pain continues, or is apt to be renewed on every slight occasion, extraction is the only cure, and it should not be deferred too long; for the consequences of such delay are sometimes very alarming, and render this necessary operation impracticable without the loss of a neighboring sound tooth.

A young lady troubled with a violent tooth-ache sent for a tooth-drawer, about half a year ago, and desired to have the last tooth of the upper jaw on the right side taken out, for the pain

was seated there particularly. He immediately applied the instrument, and, as she then believed, extracted the tooth entire. But still the pain continued, and was increased to a most violent degree by the slightest impressions of cold air or food.

In about a month after the operation, the bad effects of catching cold were added to the former complaint; the pain increased, the gums swelled, a violent inflammation seized on the muscles of the face and neck on the affected side, and the sub-maxillary glands became hard, painful, and greatly enlarged. These symptoms continued without abatement for some days, and then produced a collection of matter in the affected glands. A surgeon was sent for; he traced out the source of the disorder, and knowing that a cure could scarcely be obtained without the removal of the stump, which he judged to be still remaining, he was pleased to send for me. In the mean time he did not neglect to make an opening low down in the neck, to drain away the matter which was collected to a considerable quantity in the above mentioned glands and muscles. When I waited on the lady, the inflammation, which had long affected the muscles of the cheek and jaw, was not yet considerably abated, the mouth could not be opened wide enough to admit my finger, or to allow a proper view of the parts, and I was obliged to content myself with examining by the help of a reflected *tooth-probe*, by which I satisfied myself that a stump left behind in the operation performed by the tooth-drawer, was the sole cause of all these symptoms, agreeably to the opinion of the surgeon: it was necessary therefore to extract it at all events. As the jaws could not be opened wide enough to admit the instrument in a proper direction, and as it was impossible to extract the stump without removing the neighboring tooth which stood in the way, I took out both before I withdrew my hand. About a fortnight after this, I called to see the patient again, and found that the inflammation had subsided soon after the operation, and the disordered gland was in a condition to heal; but she told me that a violent erysipelas seized on her whole face, and endangered her life, in some days after the operation.

CHAPTER XVII.

Of the Tooth-ache and other Disorders, arising from the Last Dentition.

To avoid repetition, I find it most convenient to refer the treatment of disorders arising from dentition in young children to the third part of this work: I shall therefore only consider the last dentition in this place.

The dentes sapientiæ, on account of their great size and broadness at the extremity, and on account of the thickness and solidity of the gums at the time of puberty, are not protruded without a considerable elevation and tension of these parts. It happens also, that the dens sapientiæ of one jaw often grows to the level of the neighboring teeth, long before the corresponding opposite wisdom-tooth has made its passage through the gums; wherefore the gums must necessarily be bruised and wounded as often as the patient attempts to chew; and this concurring with the circumstances related above, produces violent and sometimes wide extended inflammations of the gums and muscles of the face, and tooth-ache, and not unfrequently abscesses, which break externally.

Nothing is more easily distinguished than this disorder, because it happens at a certain age, and seldom comes on without the patient's being well convinced by gradual advances that a new tooth is the cause.

If the tooth is almost protruded, if the gums are considerably raised, and the inflammation not very violent or extensive, the pain may be presently removed by cutting the gum quite down to the tooth, with a *large crucial* incision, to prevent a speedy re-union. But when the tumor is very large, when the inflammation has extended itself to the cheek and face, and muscles that close the jaws, so as to prevent their being opened wide, bleeding, purging, and emollient cataplasms must be used, and the mouth washed with attenuating liquors, until it can be opened sufficiently to admit the instrument, and until the parts have returned to their *natural situation*. Then a crucial incision should be made, large and deep enough, with the bistoury or fleam, to give the tooth a free passage. I say the parts should be brought to their natural situation previous to this operation, because an inflammation affects the soft muscles of the cheeks, and those that close the jaws, more considerably than the gums, and throws them out of their natural place so far, that I have known a patient to have received a considerable cut in the cheek, close by the teeth, which was intended for the affected gums. The division of the gums also should be deep and complete, otherwise they are apt to re-unite; or the slender slips which may have escaped the knife, and which lie over the tooth, suffering now a greater tension than before, are found to continue the pain and inflammation for a considerable time.

CHAPTER XVIII.

Of the Disorder which we express by saying the teeth are of an edge.

ALTHOUGH our language does not furnish a *proper* name for this affection of the teeth, it is well known, and very frequent, especially among children who are fond of eating vast quantities of acid or acerb fruits.

It is also observed to proceed from certain internal diseases, from hysteric affections, from bilious and putrid diseases, and long continued salivation; but the most troublesome and lasting kind of it, is owing to a loss of enamel.

This painful affection is chiefly felt when we attempt to chew; and unless we admit that the solid substance of the teeth is extremely sensible of certain sorts of stimuli, whilst it is insensible of other impressions which appear equally strong, it is very hard to explain how the sensation is brought about. To refer it to the gums explains nothing, for certain sounds have the same effect, and the disorder, when it arises from internal causes, may often be alleviated by rubbing the tops of the teeth with a dry towel; and the tooth-edge of children is removed by applying sorrel leaves in the same manner; which, although acid and acerb, remove the disorder left by acid and acerb apples, currants, gooseberries, or other fruits.

That sort of tooth-edge which arises from internal disorders, ceases with the general cause which produced it, and is therefore entirely the object of medical practice; that which arises from the use of acids and acerb fruits is to be cured by chewing sorrel leaves; and that which is owing to loss of enamel, particularly in cold weather, is relieved by keeping warm water in the mouth for some time, or by applying spirituous and acrid things, and by protecting the teeth from the impressions of air, cold and saccharine or acid food.

CHAPTER XIX.*Of the Intermittent or Aguish Tooth-ache.*

It happens frequently that a tooth-ache returns at stated intervals, and has the same remissions as are observable in intermittent fevers.

The very idea of intermission and that of giving Peruvian bark, are so intimately connected in modern practice, that I have a hundred times seen an intermittent tooth-ache treated with this

medicine for several months, which has afterwards been cured in three minutes, by the extraction of a carious tooth.

I will not presume to say that an intermittent fever has never shewn itself under this form, independent of any topical disorder of the pained teeth; nor will I pretend to explain why the aching of a carious tooth should cease and return at stated intervals. But I can safely affirm that I never heard of a lasting intermittent tooth-ache cured by the bark, nor have I seen one instance where the pain could not be referred to some more probable and demonstrable cause than that to which it is generally attributed; and I have cured numbers, where the bark had failed, by extracting a carious tooth, sometimes in the seat of pain, at other times in the opposite jaw, or at a considerable distance in the same jaw. Nor do I think that an intermission, and regular approach of pain, at stated intervals, is a singular appearance, or probable indication of that species of fever which is cured by bark: for, in the human system, nature universally affects stated periods of operation, and seems to be led remarkably by habit. Thus we grow hungry and sleepy at stated hours; epilepsies and madness, and some hysteric fits return regularly: thus, the asthma, whooping cough, and hectic fever, are most violent at stated hours: thus, wounds give most pain, and disorders in general grow worse towards the evening; then, why may not the pain of a carious tooth observe some order in its recess and return?

The most frequent cause of deception in this case has been, that the teeth in the pained part have been found perfectly free from every appearance of topical disease; and the observer, not knowing that a carious tooth at a distance may produce such symptoms, never searches farther, but resolves that the intermittent tooth-ache *shall* be treated like the intermittent fever.

A lady about thirty years of age, in the winter of the year 1766, was seized with a pain in the teeth of the lower jaw, which extended equally over the whole set, but was not accompanied with any remarkable degree of inflammation. She sent for her apothecary, related her complaint, and added that she had reason to suspect a cold to have been the cause of it. Resting too much upon this, he took it to be a defluxion, or a *humour falling on the gums*; accordingly he ordered purges and cooling medicines, and laid on blisters behind the ears. This treatment was continued upwards of ten days to no effect, except that the pain now became intermittent, departing in the day-time, but returning at night with double violence, and thereby depriving her of rest. Having remarked this change, he agreed with the patient in suspecting that he had mistaken the case at first; and now that the disorder began to show itself under its proper type, there remained no

doubt with him of its being speedily cured by the *bark*. The *bark* was given in various forms for upwards of a month, the pain continued, and the patient would take no more medicine, but resolved to send for me.

It was some time before I could discover any thing in her teeth or gums, to which a pain so lasting and obstinate could easily be referred. Observing, however, that the teeth were dirty, and in many places had their interstices quite filled up with slough, for want of being used, for the patient could not chew hard food ever since the beginning of the complaint, I thought it necessary to clean them well, and to examine more narrowly before I should confess my ignorance of the cause of her complaints. When I came to clean the last molaris on the right side, the instrument caught in a small carious interstice, close by the next tooth on the outside, and then I plainly saw the source of all that I have related above.

Having told the patient what I thought on the occasion, she was eager to have the carious tooth taken out immediately. I complied; the pain ceased in a few minutes after the operation, and never returned since that time.

Although cases of the intermittent tooth-ache occur every day, this furnishes more ground for observation than any other that ever has fallen under my care; for it is very unaccountable how a whole set of teeth could be so long affected by so slight a cause, whilst a wide extended caries is often seen to produce no pain at all. The similarity also between this case and the continued fevers which become intermittent, is remarkable, especially as it arose from a treatment which is apt to have a like effect in febrile cases. The constant return of the pain at night, particularly, is pretty singular; and the difficulty which I found in discovering the seat of the disorder, should teach those who are applied to in cases of this kind, that no man can detect a slight caries of the side of a tooth, unless the parts are perfectly clean, unless he uses proper instruments for the purpose, and unless his manner of examining is better than what is usually practised: for most people content themselves with looking at the upper surface of the teeth, and never consider what may lie hid on either side, under the slough, which constantly attends such disorders of them as prevent mastication.

CHAPTER XX.

Of Soreness, Softness, and Bleeding of the Gums, of Worms of the Teeth, of Stinking Breath, and Lost Palate.

SORENESS, sponginess, and bleeding of the gums, generally arise from scurvy, venereal infection, or putrid fevers, and are cured by general treatment of the original disease, by the frequent application of astringents and antiseptics, and by scarifications, when it is necessary to give vent to the over-charged vessels, or acrid matter.

The use of the brush, in cases of this kind, is condemned by some theoretical reasoners; but experience shows that nothing conduces to the restoration and solidity of the gums more than frequent brushing and cleaning.

Worms of the teeth, although talked of by some authors, are not to be seen in practice; but the fungous excrescences which rise out of the cavities of carious teeth, and which are taken for worms even at this day, occur frequently, and are to be treated with the cautery.

A stinking breath attends external foulness of the teeth, caries and purulent cavities of them, scorbutic or ulcerated gums, and the long lodgment of little scraps of aliment in the interstices, occasioned by the recess of the gums, the use of hard tooth-picks, and a bad arrangement of the teeth. The methods of cure can easily be deduced from what is said on each of these heads respectively.

Disorders of the teeth, as well as other more general ones of the whole system, sometimes bring on a caries of the palate bones; in consequence of which the food, in chewing, is apt to pass into the nose, and the speech becomes disagreeable. When these thin bones are once lost, they never are regenerated, and an artificial palate is the only remedy.

This is artfully contrived, and fitted in various ways, agreeable to the extent, situation, and other circumstances of the diseased aperture. But as I have all along avoided the description of instruments, devices, and operations, I shall not at present enter into any detail of this contrivance.

Before we finish this little sketch of the treatment of disorders to which the teeth and neighboring parts are exposed, it is necessary to remark that, for the sake of being easily understood, I have all along described and considered them in their most simple state, without representing the various combinations and complications of them, which occur in practice, and the equivocancy of the diagnostic signs, which I have affixed to each sort, when two or three diseases, uniting, confuse the common order, and produce new varieties.

The reader, therefore, will please to observe that the regular appearance which we have given to the disorders treated of above, is not meant to bestow on the subject a greater air of certainty than it deserves, nor to make him believe that he will find things precisely as we represent them, in every instance, or that he may meet with no cases besides those we have treated of. It is intended only to assist him in thinking and reasoning methodically, to furnish him with matter and practical discoveries, and with a line which may serve to guide him through the irregularities, intricacies, and doubts which occur in practice.

PART III.

CHAPTER I.

The Care and Treatment of the Teeth and Gums, to prevent Diseases and Deformities of them, and to restore and preserve their Beauty.

PRELIMINARY DISCOURSE.

BEFORE I attempt to teach how diseases and deformities of the teeth are to be prevented; before I venture to oppose the unfair and dangerous practices which prevail at this time, or to explain how the trouble and expense which are usually bestowed in preserving the beauty of the teeth, may be more advantageously and judiciously applied, and reduced within such bounds as will better suit the convenience of the people; I must beg leave to throw myself on the candor and justice of the public, and to entreat that my endeavors may be received with *indulgence*, as I have offered them with *good intent*. For I am not insensible of the jealousies and animosities to which a man is exposed, who reduces to order and fairly teaches an art that has been as obscure as its professors, and branched by crafty and *illiberal* men into various pretended mysteries; and in attempting to prevent the impositions by which a few interested individuals acquire considerable sums of money, I must expect to be followed with the enmity and malice of their party, as much as if I had subverted some useful branch of trade.

But I hope the candid and discerning part of my readers will observe, that a man who undertakes a work of this kind, is bound in justice to tell what is hurtful, as well as what is serviceable; *they* will consider that *he* does not act on selfish principles only, who teaches how people may obviate a number of those evils which are the chief sources of his own profit; who opposes fruitless expense, extortion, and deceit; who affects no secrets or peculiar excellence, nor obtrudes upon the credulous any specific compositions or nostrums; and finally, who endeavors to make his art appear the fit study of judicious men, and not the trade of mountebanks, valets de chambre, and nostrum mongers; wishing

by his example to encourage others to communicate the improvements which may be made from time to time, in the same candid, liberal manner as is observed by physicians and surgeons of repute.

As the health and beauty of the teeth depend, in a great measure, on the care and treatment of them in early life, we shall begin this part with the first dentition, then we shall treat of the second, and afterwards successively of irregularities of the teeth.

Of the reduction of them by ligature.

Of the use and abuse of filing.

Of the methods of preserving the whiteness and polish of the teeth.

Of acids, sweets, violent efforts, picking the teeth, smoking, &c.

Of the care of the teeth in advanced age. And,

Of artificial sets of teeth.

CHAPTER II.

Of the First Dentition.

FROM the third month to the second year, the protrusion of the teeth cannot fail to be attended with some degree of uneasiness, pain, and inflammation of the gums, on account of the continued state of tension in which they are kept, and the unremitted irritation occasioned by the sharp edges underneath.

If, during this time, any general febrile disorders should concur, or any other cause which is apt to increase the inflammation of these parts, and the irritability of the nervous system, the inflammation is turned to ulcers, or extends itself to the muscles of the face, to the salivary glands, and other parts, producing abscesses and a variety of disorders. Hence slavering, restlessness, headaches, pains in the ears, parotids, inflammatory and hectic fevers, rickets, convulsions, vomiting, purging, and even the death of almost one half of the children that are lost before the second year.*

But without departing from our present purpose, it is constantly observed, that dentition causes inflammation, that inflammation, if violent and neglected, causes ulcers and abscesses, and these not only can injure the growing teeth, but also the tender stamina which lie beneath to supply a second dentition.

* Those who judge of the fatality of disorders by the bills of mortality, will imagine perhaps that this computation is greatly overstretched. But it is to be observed, that most of the deaths imputed to convulsive, febrile, hectic, and ricketty disorders, are to be taken into this account, because they almost universally arise from dentition at this time of life.

Hence it appears, that the treatment of the first dentition at once concerns the health and life of the child, and the soundness and beauty of all the teeth which he has already grown, or ever is to have afterwards; and nothing can be more short-sighted and erroneous than the notion that the first teeth require no care, because they only last to the seventh year.

It is highly necessary, therefore, to watch carefully each successive protrusion of the milk-teeth, to mitigate the inflammation, to alleviate the pain, and to remove every impediment.

For these purposes, the body should be kept open with gentle purges, when necessary, mild opiates should be given at night, when the pain occasions restlessness; and above all, the gums should be divided in the part which is most prominent and raised by the pressure of the growing tooth. This incision should be made early on the first appearance of inflammation or fever, provided the operator is assured, by the age of the patient, and other considerations, deducible from what has been said in the first part of this work, that the tooth is perfectly formed, and not far distant from the surface of the gums. For it is trifling with the disease, and a timidity only founded on inexperience, to defer the operation, as is commonly done, until the gums are considerably elevated and pointed, since the chief danger and pain are then at an end, and nature is sufficient for the purpose.

In making this incision, some judgment is necessary to hit exactly the perpendicular line of the rising tooth; otherwise it will be of no use, and the tooth will take another course. The incision should likewise be made in the line of the edge of the tooth, and at the same time sufficiently large and deep, that it may not close quickly, and that no slips may be left in the way uncut. After this, the gums should be constantly moistened with a little milk, mixed with a decoction of poppy heads, to lessen the sensation and pain; and as the free discharge of saliva is found to give some relief, a little china orange juice may be added occasionally, as soon as it can be used without exciting pain in the extremities of the divided vessels.

As to the custom of encouraging children to chew upon coral, wax, and such like bodies, I am of opinion that it is always either hurtful or useless: for when the gums are not inflamed, the work should be committed entirely to nature, and not to the impatient, capricious fancy of an infant, who, guided only by the feelings of the present moment, bruises the gums against the sharp edge underneath, and brings on inflammations, which would not perhaps have happened were the work permitted to be done by slow and insensible degrees.

But when the parts are already inflamed, most certainly such

pressure, irritation, and wounding of them, as happen in biting a hard body, must increase every evil; I am therefore for leaving the whole to nature, whilst she is indulgent, or for making a free passage at once, as directed above, when it is necessary. I think also the *nurses* act very imprudently, who endeavor to cut the gums with their *nails*, or a sixpenny-piece, as nothing can be more evidently erroneous than the common notion that it is safer to cut them in this manner, than with the *lancet*: it is to be hoped, therefore, such practices will not be continued.

CHAPTER III.

The Care and Treatment of the Second Dentition.

It is observable, that in the first dentition, the teeth are seldom or never discolored, ill placed, or subject to any pain, except what arises from the cutting of the gums. But in the second dentition it happens otherwise; because the first stamina, whilst they lie under the milk-teeth, are frequently affected and even destroyed by the inflammations, suppurations, and other disorders occasioned by the first dentition; because, in their tender, yielding state, they are often furrowed and indented by the pressure of the milk-teeth, stunted in their growth, thrown out of their proper direction, and sometimes turned in their sockets, so as to leave interstices, in which small portions of food are apt to lodge and rot, and forward the production of tartarous concretions, caries, &c.

The second dentition, therefore, requires as much care as the first, and indeed as frequent observation of its progress.

After the sixth year, the milk-teeth are gradually urged by the set underneath, their roots are destroyed by the constant pressure, and then the bodies easily give way, without pain, in the ordinary course. When it happens that the roots of the milk-teeth are stronger and harder than usual, and that the succeeding set is soft and feeble, the milk-teeth retain their places, and last to old age; if the new growth is vigorous, but yet finds the milk-teeth too hard and firm to be expelled, it takes a new course, and sliding by them, emerges above the gums, on the outer or inner side, forming a double row in one or both jaws, sometimes complete through the whole anterior arch, sometimes only double in one, two, or three places; and this is the true cause of odd *supernumerary teeth*, or *double rows*. Sometimes the resistance or pressure of the milk-teeth only produces indentures, or hurts the shape of the succeeding set; but the most common evil arising from neglected dentition is the unevenness or irregular position of the teeth, which happens when the milk-teeth are pushed out by the

succeeding set ; but not without having first given such oblique resistance, as to throw them out of the just and symmetrical order in which nature had kindly placed them.

It is well known that some of the anterior teeth come forth much earlier than the others; and formerly we observed, that the anterior teeth in the second dentition are considerably larger than the milk-teeth of the same part, at the same time that the first and second molares of the first dentition are larger than those of the second dentition which succeed them. Hence it happens, that a fore tooth of the second dentition has not only to encounter with that which lies immediately over it, but also with one or both of the neighboring ones: and if these are not yet ripe for shedding, or if they are permitted to remain too long, the emerging tooth must either be thrown out of order, or it must be stunted and indented by rising into a very narrow space. These, I say, are the true causes of snagged, rough, and indented teeth; and were parents and governesses duly informed of the importance of such early care as I endeavor to recommend, I am certain the usual negligence on this occasion would not be of long continuance, nor would disordered, ill set, or discolored teeth be seen so often in advanced life as at present.

Such deformities are easily obviated, although not easily cured; for if a child, at his sixth or seventh year, is put under the care of a person who is competently versed in anatomy, and the nature and progress of this dentition, he will determine what teeth are first to be expected; and by the feel, position, and color of the milk-teeth, he will be able to judge whether they should be removed immediately, or when they may safely be left for a longer time. This may likewise with some certainty be determined, even by the parents or governesses, in the following manner.

The second dentition comes nearly in the same progressive order as the first; and from what has been said in the first part of this work, it is easy to ascertain what teeth are to be expected and assisted first, and what are the common intervals between the successive protrusions of the rest, the whole taking six or seven years.

Now, since it happens that the roots of the milk-teeth are obliterated and destroyed by the pressure of the set underneath, long before the time of shedding, provided things go on in the proper course, it is to be expected that a milk-tooth, about the ordinary time for its falling out, should be somewhat less firmly fixed in its socket than a tooth whose root is long, and well supported. I do not mean that it should at this time be very loose, or that its motion should be distinguishable to the eye, when it is forced backward or forward by the fingers; but that it should discover,

to a nice touch, such a degree of instability as can be judged not to belong to a long rooted, well fixed tooth.

In this manner, I say, it may be known when the milk-tooth has lost its root, when it is not very likely to oppose the growth of that which lies under it, nor to throw it into a wrong direction, and how long the case may safely be committed to nature.

But if, at the ordinary time of this second dentition, no degree of looseness can be felt even in the front incisors, which generally fall first, it is a sign that the growth of the set underneath does not proceed with vigor, and that the adhesion and firmness of the milk-teeth overmatch its protruding power.

In this case, a prudent and well-timed extraction of the milk-teeth, at proper intervals, insures a quicker growth of the succeeding set, and a beautiful arrangement of them; because all oblique pressure or resistance is removed.

Some people, who have committed the care of their children, in due time, to a surgeon dentist, and yet have not obtained for them the advantages expected, will reply on this occasion, that the extraction of the milk-teeth and all the care of the surgeon dentist are of little use. It is necessary to observe, therefore, that the failure of success has not been owing to the universal defect or inutility of the art, but to the timidity of the artist, or to his not being acquainted with the fact related in page 11. A fact which has never, before this time, been duly attended to, or even talked of by any author or practitioner, so far as I can learn.

Now, if what I have said on that occasion, be admitted for truth, it is plain that the common practice of removing a single milk-tooth, to make way for the young tooth that lies under it, is not sufficient to insure success: for, since the fore teeth of the second dentition, on account of their increased bulk, must and *do* edge away towards the molares, in order to encourage the free and regular growth of one front incisor, it is absolutely necessary to remove not only the milk-incisor which stands fairly over it, but also the lateral incisor which lies over it *in part*; and so on for the rest progressively. I say, wherever a proper use is made of this observation, neither the patient nor the dentist will be disappointed.

But great caution is necessary here; for it is to be considered that the stamina of a second set have, in some cases, been destroyed by preceding disorders, and then it is better to leave the milk-teeth, which sometimes last to old age, than to rob the patient of their use and ornament.

Such a case, however, is very rare, seldom exceeds to above one tooth, and cannot lead a judicious dentist into considerable error; for the first tooth extracted shows, by the state of its nerve and root, whether there is another underneath or not; and if the

doctrine of a third set of stamina has any truth, this gives it the fairest opportunity of coming to maturity.

When the milk-teeth, about the sixth or seventh year, from being even and well set, begin to turn irregular and snagged, it is plain to demonstration, that the succeeding set does not press on their roots in the proper direction, and that such an oblique action and re-action is as likely to throw the new set out of order, as it has evidently affected that whose irregularities are visible.

So soon as this is perceived, whether it be in the fifth, or in the eighth, or any intermediate year, every milk-tooth, so departing from its natural position, should be constantly extracted, that the young tooth beneath may no longer be urged obliquely, but that it may be free to rise in just and proper order.

In drawing these teeth, great care should be taken to make use of proper instruments, and to apply them in a judicious manner—the only security against breaking the root, or the edge of the socket, or tearing or bruising the gums; for any error committed here, endangers the young shooting teeth, which may easily be disordered or destroyed by inflammation, or purulent matter falling on the socket and surrounding membranes.

Thus, in early life, we may be preserved from a deficiency of teeth, from double rows, from supernumerary teeth standing obliquely against the lips outwardly, or against the tongue within, and thereby occasioning ulcers and constant uneasiness, exclusive of the deformity. Thus we may, in general, be preserved from diseased, stunted, indented, and discolored teeth; for these are the consequences of inflammations, suppurations, pressure, and obstruction, which we have taught to obviate. And finally, we thus prevent that want of symmetry and regularity of the teeth, which not only robs the countenance of its greatest ornament, but also gives rise to discoloring tartarous concretions, and a variety of evils.

CHAPTER IV.

Of Irregularities of the Teeth, and the Reduction of them by Ligature.

IRREGULARITIES of the teeth are extremely frequent, where none of the above mentioned precautions have been taken, and where the second as well as the first dentition has been neglected as a matter of no concern; it is often required, therefore, to correct by *art*, what at first might easily have been prevented.

To bring teeth which are ill set into beautiful order, at any time of life, is promised every day in the public papers, with the

greatest assurance, by several people who profess themselves *dentists*; and I am afraid that there are people enough to believe such advertisements, and to accuse every man of ignorance, who should affirm that it is impossible. Yet, notwithstanding all this, I will freely own that I never have, nor ever will attempt this ingenious practice upon *grown people*; for reasons which I shall assign, after having first shown the different methods of it.

The first is to pass a gold wire or silken ligature from the neighboring teeth on either side, in such a manner as to press upon that which stands out of the line, in a direction which shall tend to reduce it.

The second is to fix a thin, elastic gold plate, of the breadth of a watch-spring, on that side of the tooth which recedes most from the proper line, and then to fasten the ends of it to the teeth on either side, so that the bent of the spring may tend to press the irregular tooth back to its place. This, and the former contrivance, may be applied where one or more teeth incline inwards, as well as when they project externally.

The next method is not quite so gentle, and consists in breaking the teeth into order, by means of a strong pair of crooked pliers, after which the ligature is to be applied.

The last is, to file them into order.

In advanced age, it is well known, that the teeth are so deeply and firmly fixed in the substance of the jaw-bone, that it requires a considerable power to force them out of their places, and that none of the bones, at this period, will yield to slight, continued pressure, in the same manner as the tender, growing bones of children will do. But without a yielding of the bony sides of the sockets, or of the flinty substance of the teeth, how is it possible to bring a tooth which projects outward, or inclines to the inside, into the proper line? or supposing this were feasible, if the pliant bones of children require a considerable length of time to effect such alterations, what would be the time necessary on this occasion? what the degree of pressure? who could support such lasting uneasiness? if we may tell the truth, such notions belong to fancy, not to practice; and such promises are founded on ignorance, or intended for *deceit*.

The same observations apply to the second method, or to those that pretend to have used the elastic plate successfully.

As to the third, it is such a treatment as need not be opposed; because it is not credible that any grown person is so easily persuaded, and so regardless of pain, as to submit to the trial. But supposing the case were otherwise, it is well known that a tooth in a grown person cannot admit of any considerable change of situation, without being raised out of the socket; so that whilst the operator

brings it into the line on one hand, he raises it above the level on the other; he destroys its connections, exposes it to looseness, pain and decay, and makes it incapable of bearing the ordinary impressions in chewing; an evil much greater than the total loss of a tooth.

As to *filing* the teeth into proper shape, size and order, I know that it is practised every day, and shall therefore consider it more at large, after I have first pointed out some instances where the reduction of the teeth is practicable and safe, and which serve as a pretext for the exaggerated accounts, and the incredible pretensions of those who promise to succeed at all times.

Between the seventh and twelfth year, whilst the teeth are growing, and the sockets in a condition to yield, by degrees, to any constant pressure, if the edge of a tooth stands out of its proper direction, it may oftentimes be brought back, provided the patient will bear a ligature, as described above, to continue on for a long time, and to be tightened occasionally; provided likewise that the projection of the tooth out of its required direction, be not very considerable, and that the pressure do not fall solely on the two neighboring teeth; for it always should be divided by throwing a few turns of the wire or ligature over some of those that stand at a distance. The use of the elastic plate is more inconvenient to the patient, but not more effectual than this method; and the application of instruments, to force the teeth at once into order, is extremely dangerous at any age; since it is more likely to loosen them, and make them fall, than to give regularity and beauty.

CHAPTER V.

Of the Use and Abuse of Filing to remove Irregularities of the Teeth.

THERE are many instances in which it is advisable and safe, as well as ornamental, to file the teeth; but as it is usually practised, nothing can be more pernicious.

Since it cannot be supposed that any man is so lost to shame and humanity, as to expose his patient to pain and inconvenience during life, merely for the sake of a trifling fee, the indiscriminate filing of teeth, so common at present, should be imputed only to ignorance, and may, I hope, be checked, by placing the subject in a clear light, and by drawing the line to distinguish where it may, and where it may not be practised with safety.

1. In people far advanced in years, the teeth may be filed into order without any inconvenience; because the nerves are lost,

the teeth can feel no pain in the operation, nor afterwards from cold, acids, or sweets, and because they are not then so much subject to caries or decay.

2. Where a tooth projects beyond the common level, and hinders the rest from meeting equally, or receives, on itself alone, all the pressure which should fall divided on a whole set, there, filing is necessary, at any age, to remove the greater evil.

3. Filing is necessary and advisable to remove sharp points, occasioned by fracture or otherwise, which irritate and wound the lips and tongue; because, in this case, the bony part of the tooth is already exposed, and cutting off the sharp prominences cannot make it more liable to caries or pain than it would otherwise have been.

4. Where a tooth points obliquely against the tongue, or against the lips, as often happens on account of the resistance of the milk-teeth, it is necessary to round the edge by filing, to prevent its wounding the soft parts.

5. When the edges of the fore teeth are uncommonly sharp and thin, and therefore apt to splinter, it is very proper to file them down, to give them a more obtuse and durable edge.

6. Filing is likewise advisable to remove caries, to prepare a tooth for the reception of a new crown, and in a few similar cases, related in the second part of this treatise.

7. When the teeth stand irregularly, and are too broad to admit of being reduced to one uniform line, filing between them, to lessen their size, may be practised to a certain degree; but great care should be taken not to cut away the enamel totally, as is too often practised on this occasion.

If a man had no feeling, nor any other use for his teeth but for the ornament of his countenance, I should not limit the use of the file to these cases only. But since most people, from infancy to middle-age, feel insufferable pain the very moment the file touches the bony substance: and since this pain must be very often repeated, because each successive surface of the osseous substance must have some time to wither, and lose a part of its sensibility, before it can admit of filing beyond a certain depth; since it happens, likewise, that the enamel once removed, is never regenerated, that a tooth in this naked state is for a long time affected with pain from the slightest impressions of cold, acids, sweets, &c.; that it wears away quickly, and is very much subject to decay; I cannot join to support the common practice of indiscriminate filing; I think it should be confined to the cases above related, for I believe it is advisable in these only.

Hence it is, that I so frequently refuse to perform this ornamental operation for my patients, and that I have often advised young

people, who have credulously listened to advertisements and promises of this kind, never to barter a sure and valuable blessing for such a painful, dangerous, short-lived ornament : for ill set or irregular teeth may last healthy and unpained to the latest period of life, and the deformity in general is not very great, provided they are kept clean, white, and polished.

The cautions which are to be observed in filing, and the methods of reducing the projecting teeth to one uniform edge, so that the upper and under rows may touch every where, when the jaws are approached, I shall not touch on at present ; having through the whole, endeavored not to swell this work with descriptions which are only intelligible to operators, who ought to learn the mechanical part of this art from experience and not from books. I will not, however, conclude this chapter without observing, that the people of this country, who practise on the teeth, are not quite so liberal in their promises, nor so fond of cutting and filing, as the *gentlemen* who quit the continent *for our sakes*, and walk in a more exalted sphere, piquing themselves on the dignity of having served *Counts* and *Marquises* in the station of *valets de chambre*, and of having seen the art of filing practised in *twenty provinces*.

CHAPTER VI.

The Method of Preserving the Whiteness and Polish of the Teeth.

THE generation and texture of the tartarous and other matters, which discolor the teeth, and destroy the shining polish of the enamel, and the evils which attend long neglected complaints of this kind, together with the methods of cure, we have considered pretty fully in the second part of this work ; but referred the preventive treatment, and all that concerns the beauty of the teeth, to this place.

The methods of whitening the teeth, and of preserving them from tartarous concretions, or discoloring slough, are very different and seem to concur only in this one point—that they all are extremely pernicious, as they are now used, excepting only where the tartarous matter is removed by the instrument ; for all act directly for the destruction of the enamel, either by *mechanical grinding*, or *chemical dissolution*.

These of the former sort, whether sold under the name of a powder, electuary, or opiate, whether whitened or darkened, or otherwise colored by certain additions, are always composed of pumice-stone, emery, or some other cutting powder. These of the latter sort, however tinged with *sanguis draconis*, *cochineal*, *alkanet-root*, or other drugs ; and however changed in taste by

spirituous, camphorated, and various mixtures, are always composed of *mineral acids*, particularly of vitriolic; and although, in *modesty*, they are called tinctures, &c., they are really very powerful menstrua to soften and destroy the enamel.

That the powders which are usually sold for cleaning the teeth, do, in some measure, hurt the enamel, is too obvious to need any argument; but it is not generally believed that they are so pernicious, as to deserve particular notice or censure. I thought, therefore, it would not be improper to put this matter to the test, and to ascertain, as nearly as possible, in what time, and how far they are or are not destructive.

I fastened in a vice a sound and well enamelled human tooth, placing the convex side uppermost: I then took a brush, wetted and charged with a certain tooth-powder, which I had bought for the purpose, and in less than an hour, by rubbing quickly with this brush and powder, I wore away entirely the enamel of the part which was exposed to their action.

The like experiment I repeated with all the different tooth-powders, and found the same effects, varied only a little in time, according to the coarseness or fineness of the powder, and the different hardness of the enamel.

Now, it is well known, that a number of people brush their teeth with powders of this kind two or three times a-week; and if we allow that the brush and powder generally act on the front teeth briskly for one fourth of a minute each time, in the space of a month they act three minutes, or in two years seventy-two minutes; that is to say, in the space of two years, the teeth have undergone a great deal more brushing than was found sufficient to destroy the finest and best enamel.

Hence those that brush with powders only once a-week do not destroy the enamel in less than five or six years; and those who use powders but rarely, can never be brought to believe, that their teeth are injured by them, because the destruction creeps on too slowly to be observed.

To all this, I presume, it will be objected, that the enamel is known to increase in thickness, from childhood to puberty, although some part of the original growth is certainly worn away in the mean time; and since it evidently appears from thence to admit of growth and repair, it may do so likewise at a more advanced age, and supply whatever is lost by the use of tooth-powders. It may be added too, that although it seldom or never is restored in a part where it has once been totally separated from the bone, yet it may, like the *bark of trees*, receive new layers, and be repaired so long as any part of its internal substance remains unhurt beneath. But all this reasoning is founded upon

suppositions, which are not yet countenanced by any certain evidence, and therefore cannot be opposed to daily observations and matters of fact, which teach us that the enamel wears away quickly, even in mastication, after the twentieth or thirtieth year, and that it is totally lost, at a very early time of life, in those who use tooth-powders imprudently.

Some people, who have been convinced of this truth by striking examples, imagine that the danger may be avoided by using a cloth instead of a brush. To try whether this notion was well founded or not, I took a well enamelled human tooth, and fixing it in a vice, in the manner mentioned above, I rubbed it smartly with a cloth dipped in tooth-powder, for half an hour, by which time I found the enamel quite worn away. Having repeated the same experiment several times, I found that the cloth destroys the enamel in half the time which was found requisite for this purpose with the brush : for which reason, and because it does not enter the interstices of the teeth, it is evidently more destructive, and much less effectual in removing the tartar.

Having thus endeavored to explain the action of tooth-powders, and pointed out the evils occasioned by the indiscriminate use of them, it is necessary, for the instruction of my readers, and in justice to the people who are interested in the sale of such things, to show where they may be applied without any danger, and how, under due restrictions, they sometimes conduce to the duration, as well as to the ornament of the teeth and gums.

1. Where the teeth are discolored with a very thin scale of tartarous matter, or by a superficial tarnishing of the enamel, the common tooth-powders may be used, until that substance is worn away, but no longer, on any account whatever.

2. After a thick tartarous crust has been removed by instruments, any tooth-powder may be applied to remove whatever slight discoloring matter still adheres to the enamel ; but when that is gone, they should be no longer continued.

3. Lastly, those who cannot brush their teeth often, or take proper care of them, for want of leisure and conveniences, may use rough tooth-powders once a month, to clear away the tartar expeditiously and completely ; because the evils arising from total neglect, with those especially who are by constitution disposed to generate tartar very quickly, are greater in general than any that can be produced by this sparing use of tooth-powders.

Tinctures for cleaning the teeth are so easily applied, so effectual, and contribute so largely to the dentist's profit, that I wish it were consistent with truth, and the safety of those who might be induced to use them, to speak in their favor, or to retract what was said in the beginning of this chapter.

The daily instances of their bad effects, and their being composed of mineral acids, have long been used as arguments against them, by impartial and good judges; but to no purpose, because these assertions have been as little credited as they have been ill supported, and they have not been conveyed to the people in so effectual and general a manner, as the plausible and artful addresses of advertising nostrum-mongers. It still remains, therefore, to clear up this matter, in a manner suitable and satisfactory to the generality of readers. It is to be observed, before we proceed farther, that some of the people who sell tinctures for the teeth and gums, keep two sorts, and make a very just distinction in the sale of them. One is given for strengthening the gums, for curing the flabbiness and bleeding of them, scorbutic ulcers, and the stinking breath occasioned by such complaints. It is generally composed of grateful resinous substances, vegetable astringents, and spirits variously flavored and colored; is a good liquor to wash with when the gums require it, and is entirely harmless, whether they want it or not.

Others sell tinctures for the teeth and gums, which they recommend, together with their tooth-powders, under one general character; thereby rendering it necessary for the patient to buy both in every case, and impossible for him to determine how many of the virtues, recited in the advertisement, belong to the tincture, how many to the powder; or whether all that is said of both does not apply with equal justice to either; although one is an innocent wash, equally as fit for the face and hands as for the mouth; whilst the other is an active dentifrice, possessed of all the grinding virtues recited above.

I say these, or such like tinctures, since they are innocent, and as good as *water* (although not quite so cheap) are not the objects of our censure; I mean only to consider that sort of tincture which is sold for whitening the teeth, &c.; and which is composed of mineral acids diluted and concealed by various artifices.

This is evident from the sour astringent taste; from the roughness and peculiar sensation of the teeth to which these tinctures are applied; from their losing these properties, and becoming neutral on the admixture of an alkali; from their effervescing with oil of tartar, as much as can be expected from an acid so much diluted, dulcified with spirits, and covered artfully by camphor, coloring drugs, &c. And lastly, from their whitening the teeth, which cannot be done *so speedily* by any menstruum except a mineral acid. Let us then examine the power and effects of mineral acids thus applied.

I put half a dozen sound and well enamelled human teeth into a glass full of spirits of nitre; in a quarter of an hour the shining

polish of the enamel was destroyed. In six or eight hours the substance of the enamel, and of the bony root of each tooth, was cut away to a considerable depth, and the enamel which still remained was so much altered, as to be easily scratched and cut with the point of a knife; in three days the teeth were totally destroyed.

I then put the same number of sound teeth into a glass full of spirits of nitre, diluted with an equal quantity of water, and placed the glass near the fire, so as to receive a heat nearly equal to that of the human body. The effect was the same as in the former experiment, with this difference only, that the solution proceeded much more slowly. The *nitrous acid*, therefore, whether strong or diluted, can destroy the enamel as well as the bony substance of the teeth, although it should be used but very sparingly, and not permitted to act for any considerable time; it is evident, likewise, that the softness, which it occasions in that part of the enamel which it has not had time to dissolve, is extremely hurtful to the polish and duration of it.

The *muriatic acid*, tried in the same manner, softens and dissolves the enamel and bony substance of a tooth, almost as powerfully as spirits of nitre: and it is remarkable, that whilst it dissolves the external surface into a ropy mucus, the internal parts are discolored to a considerable depth, and turned into a semi-transparent horney substance. Hence, perhaps, arises the bad color of the teeth so remarkable in seamen, who live on salted food, and whose blood is said to be charged with sea or ammoniacal salt.

I treated several sound teeth with the strongest *vitriolic acid* in the same way, and after a few hours found them extremely white; but neither the enamelled or bony parts seemed to be dissolved, as happened when the nitrous or marine acid was used. I let them lie, therefore, for three or four days, and even then the quantity dissolved was not considerable: but the enamel became rough, and so far altered in its texture, that I could easily scratch it with a knife; the color also, instead of being a semi-transparent white near the edges, was a dead white like that of chalk.

I then tried the same acid variously diluted, and found it to act as powerfully and directly in the same way, when mixed with six times its quantity of water, as when undiluted. It appears, therefore, that it is more effectual than the others in whitening the teeth, that it does not destroy them quite so fast, and it is judiciously chosen by those who sell tinctures for cleaning the teeth, as the least pernicious of all the mineral acids.

But although it acts slowly, the destruction, which it brings on, is not the less certain. When once the teeth lose their polish, the

tartar is constantly renewed, the acid must be as often repeated ; and a few months can do effectually with the *vitriolic acid*, what a few days will effect with the nitrous or marine.

I can easily foresee that those who recommend tinctures for cleaning the teeth, will endeavor to evade these arguments by saying, that they are only used where tartar covers and defends the enamel, or that they are so much diluted as to be incapable of attacking it. But it is well known, that the edges of the teeth are very rarely covered with tartar, even in those whose teeth are very tartarous near the gums ; wherefore, the exposed enamel must suffer in this part, whilst the tartar is slowly dissolved elsewhere ; and it needs no argument to prove, that if oil of vitriol with six parts of water can visibly affect the enamel in two or three days, it may destroy it totally in a few years, although it should be greatly diluted beyond this proportion.

Indeed, to talk of the dilution of the acid, is a very weak evasion of the truth ; because, if vitriolic acid be so greatly diluted as not to affect the enamel in a considerable space of time, it is proportionally incapable of dissolving the tartar, as I have repeatedly experienced ; therefore, the strongest vitriolic acid that can be used in this way will hurt the teeth as little as the weakest, because it need not be long applied ; and if the enamel be twenty times less soluble than the tartar, one certain portion of the enamel, which is exposed, will be destroyed for every twenty portions of tartar, whether it be applied weak or strong, for a minute or for a year.

Observing that one of the most celebrated tinctures for whitening the teeth lets fall an earth like that of alum, when a little alkaline liquor is added ; I suppose it will be alleged, in further defence of them, that the vitriolic acid is in a neutral or aluminous state, which will not allow it to act as a pernicious solvent.

If it is no longer a solvent, how comes it to dissolve the earthy tartarous concretions of the teeth ? If it can destroy these, why not the earth of the enamel too, as usual, and in a degree proportioned to its solubility ? Or supposing we were to say, at once, that most tinctures for whitening the teeth are chiefly composed of alum-water and spirits, for the flavoring or coloring drugs are nothing to the purpose, will this prove them to be harmless ?—Not at all.

A solution of alum mixed with spirits lets fall a great part of its earth : the acid thus forsaken, takes but slight hold of the spirit, and is ready to attack any earthy body that has an affinity with it : wherefore, alum-water and spirits, however colored or scented, form a liquor as hurtful to the teeth, as a mixture of oil of vitriol and spirits containing an equal quantity of naked acid.

Exclusive of the effects of this acid, as a solvent of the earthy parts of the enamel, there is another consideration, which is still more weighty and more demonstrative of its pernicious effects. I observe, that the enamel cracks and splinters away from the teeth of those who use acid tinctures, and is thus totally lost, long before the acid has had time to corrode it to any considerable depth: were it not improper in my business to mention names, I could recite a great many instances of this kind.

But, notwithstanding the daily proofs of this effect of the vitriolic acid, which has occurred in practice, I must own I was always willing to refer the splintering and mouldering of the enamel to other causes, even in those who used the acid tinctures: until the following experiment taught me how easily its hardness and texture may be destroyed, without any *visible loss of substance*.

If a tooth be placed on a red hot poker, and held thus over a sheet of clean paper, the enamel presently flies off in small pieces, with a crackling noise; but if it be gradually warmed and advanced to the hot part of the poker, until the bony part of the tooth begins to smoke and turn black, then the enamel does not crackle and fly to pieces so much as in the former case; and in a number of trials it may be separated almost entire from the parched bone in the form of a cup: it still retains its shape and size, but its polish is gone; its semi-transparent white is turned to a chalky white mingled with grey, occasioned by the oily smoke of the bone; and in place of a flinty hardness, it breaks between the fingers, and can easily be scratched with a knife.

That principle, therefore, which gives cohesion to the enamel, is very easily expelled, is a very small, nay, an invisible part of the whole, and may be acted on by the vitriolic acid as well as by a slight heat. Were these experiments pushed farther, it might, perhaps, be easily proved, likewise, that the nitrous and marine acids act on the earthy and all the parts of the enamel, whilst the vitriolic attacks the cementing principle chiefly, and the *earthy* one, by very slow degrees.

But the dangerous tendency of acid tinctures for whitening the teeth, does not seem to be confined to this direct action on the enamel and bony substance. For in those who have used them long, I have generally observed the connection between the teeth and gums to be greatly injured, and sometimes so far destroyed, that the corrosive liquor could easily make its way into the sockets. I will not be so positive as to say, that this was owing to the tinctures only; but I am very certain, that tinctures of this kind are particularly dangerous, where a bad state of the gums permits them to find a passage into the sockets, or to attack the teeth below the enamelled part.

These experiments and friendly hints, I formerly thought sufficient, not only to caution and instruct my readers, but likewise to effect a reformation in the composition; and mode of administering the various dentifrices; expecting to find each respective vender of them as unwilling to persist in a known and dangerous error, as I was unwilling to descend to personal censure. But I have been disappointed: for instead of collecting from this treatise such instructions as might serve to direct them in the choice of innocent dentifrices, they have only learned to talk plausibly on a subject, of which they were totally ignorant before; and each of them repeating my observations and experiments, and *kindly* adopting them as his own, concludes with assuring the public, that his dentifrice contains none of "*the coarse, sharp, cutting substances* used by his brethren, and which in a course of *long and successful practice* he has found to be extremely pernicious: *His composition has nothing in it but what is of the softest and smoothest kind, free from every thing that is in the smallest degree injurious.*"

Plausible harangues and advertisements of this kind, are apt to deceive even the most sensible and judicious, whose candor and humanity will not permit them to suspect that any man, placed above the want of common sustenance, can, for the sake of a few shillings and half-crowns, repeat so audacious a falsehood, as to assert, that the substance he sells, is the "*softest, smoothest, most balsamic, most anti-scorbutic, most anti-putrefactive, most anti, &c. &c.*" whilst at the same time it contains, in considerable quantities, the very "*hard, sharp and injurious particles,*" which he condemns, and is directly calculated for the destruction instead of the preservation of the teeth.

Now, to take a middle course between the mean office of attacking each of these nostrum-venders with such direct censure, as might tend rather to ruin, than to reform them; and the greater fault, of permitting fraud and imposition to carry away the just reward of industry and merit, whilst the public is abused, and many individuals essentially injured: to avoid these extremes, I shall content myself with giving, in this second edition, such instructions as will enable every reader to examine and determine, with demonstrative certainty, whether all I have advanced on the subject of dentifrices does not apply, as generally as I expressed it: whether any of them answer to the character bestowed upon them in printed advertisements, or verbal encomiums at the time of sale. Thus every person, who considers the preservation and beauty of his teeth and gums as matters worth attention, will be prompted to examine the respective merits of these "*incomparable, most excellent, most admirable, most cele-*

brated dentifrices ;" and the venders will either be forced to adopt innocent and judicious compositions, or be glad to decline the present tooth-grinding trade,—instead of "*wishing (without offence) to decline the mechanical, contemptible business of drawing teeth, for the more laudable and genteel profession of selling these elegant and infallible nostrums.*"

The whole science or mystery of forming a dentifrice like those now in fashion, consists in covering and concealing the stuff which scours the teeth, by a plentiful admixture of various matters, chosen or taken at random, according to the trade, the ignorance, or caprice of the composer.

Some of them, wishing to give a medicinal appearance to their *scouring stuff*, add to it a considerable quantity of cassia lignum, and some testaceous powder; and then, by moistening the mass with syrup, or a solution of honey in water, form it into an electuary; for no other purpose, that I can conceive, except that the composer may have some grounds for making *honorable mention* of it, in his ingenious work, under the style and title of "*A medicine for the teeth,*" and "*A remedy for the teeth :*" or that he may be secure and unrivalled in the monopoly of it; having chosen such a mixture, (I will not call it a medicine,) as it could never enter the head of another man to use or imitate, for the purpose of cleaning and *preserving* the teeth.

Others, taught by their trade the effect of color, dress, and decent exterior, attend more to the appearance of the composition than to any other circumstance, and therefore choose to cover the active basis, consisting of emery or sand, with a considerable quantity of logwood, and some testaceous powder to increase the bulk. Substances which admit of no union; which are the most easily separated and distinguished; and such a vegetable coloring ingredient too, as is more likely to stain the lips and mouth, than to conceal the active grinding basis of the dentifrice. But why do we look for pharmaceutical knowledge or judicious composition *here*? It is almost an age since the surgeons and barbers have quitted company.

But to be serious; all the *dentifrice makers* discover as much absurdity in the choice of those substances which give the color and medicinal or artful appearance, and which cover the active basis, as they do barbarity and ignorance in the choice of the basis itself. Even the white powders, lately adopted by some for the sake of novelty and singularity, are, of all others, the most puerile deceptions, and the most preposterous compositions. Puerile, because the taste of cream of tartar, which forms a considerable part of them, is known to every one, and easily discovered; and because the solar earth, which helps to cover the

sandy scouring stuffs, is easily separated from them. Preposterous, because cream of tartar is the strongest vegetable acid, though sold for preserving the teeth, by the very man who so loudly exclaims against sharp corrosive particles, and calls *sugar doubly corrosive*.

The ignorance, therefore, of the composers of these dentifrices, has rendered the labor of analyzing their constituent parts very easy. But since it is repugnant to the plan which I have proposed, to publish a complete analysis of each, or to point at any nostrum or nostrum-vender particularly, I shall only give one simple process, whereby the scouring, pernicious ingredient of each dentifrice may be stripped of all these medicinal and beautiful coverings, and detected by any person, however little acquainted with matters of this kind, under the plain, native form of emery, sand, rotten-stone, pounded china, crocus, pumice-stone, burnt bone, &c.

Take of any dentifrice powder or electuary, one ounce, throw it into a quart of water, stir it up, and after a few minutes pour off the water, together with the light matter which remains suspended in it: let this be repeated nine or ten times, taking care always to preserve the heavy mass, which subsides quickly to the bottom, and observing that the oftener fresh water is added, the less time is requisite or needful to be allowed for the coarse powder to subside.*

This last then perfectly separated, by repeated ablutions, from the light ingredients, which we have pointed at above, is to be received on a piece of soft paper, and placed before the fire until it dries; then it is easily observed to consist of one or more of the sharp, cutting powders mentioned above.

As substances of this kind are daily used for grinding down steel, glass, and the hardest stones, we shall commit it to the reader to determine how far dentifrices, as now sold, are useful or pernicious; and whether the addition of powdered wood, testaceous earth, or any of the other materials which are usually added, can prevent sand, emery, and such like substances, from grinding away and destroying the enamel, any more than the admixture of a handful of flour or saw-dust with as much sand can prevent this last from scouring and grinding away the toughest metals and the hardest glass.

Whoever takes these things into consideration, together with what has been advanced, and experimentally proved, at page 70, and who reflects on the evils and deformity which follow the loss of the enamelled covering of the teeth, needs not, I think, be farther admonished against the use of these fashionable compositions,

* Any dentifrice opiate may be treated in the same way, after having been first softened with warm water.

or more fully persuaded of the necessity of trying even the most celebrated and best puffed dentifrices, by the process related above, before he ventures to use them freely. Therefore, I shall only add, that every man who adopts this measure, serves the public as much as himself, because the venders of dentifrices, as soon as they find their customers thus disposed to examine, will, out of regard to their own interest, listen to reasonable admonition, and must resolve to offer such things only as they may honestly sell, and the buyer safely use.

Let us now proceed to teach how the beauty of the teeth may be preserved from infancy to old age, by such care and treatment as shall be free from all the dangers which belong to powders, electuaries, and tinctures.

As soon as the second teeth appear, the parents and governesses should take care to make the children wash their teeth every morning, with common water and a convenient tooth-brush; and after meals they should be accustomed to rinse the mouth, and rub the teeth with their fingers, when a brush cannot be conveniently used. Those who constantly observe such instructions, may depend upon being for ever free from tartarous matter, putrid slough, superficial discoloring, flaccid gums, and from the pain and looseness of the teeth, arising from these causes.

I know it is a very common opinion that brushes are hurtful to the gums; and the only reason which can be assigned for it is, that brushing makes the gums bleed, that it therefore seems to wound them, and disturb their connections with the teeth. It is true, no doubt, that brushing the gums will have this effect at first, with those who have not been used to it, and whose gums are soft or fungous. But where it is constantly used, instead of hurting, it gives a salutary irritation, it fills the vessels, elongates the fibres, and gives a firmness to the gums, which conduces greatly to the soundness and duration of the teeth; add to this, that the relics of food or slough of the teeth cannot be cleared away so effectually by any other method. Some people prefer the fibrous end of the prepared marsh-mallow roots, which is sold in the shops under the name of dragon's blood; but it is not by any means so good as a brush, because it cannot enter the interstices so well, because it is apt to leave its broken fibres between the teeth, because it is not durable, and above all, because it acts like a cloth, which we have shown to be hurtful.

Where the teeth have been neglected at first, and when tartarous matter has already fastened to them, after having removed it by instruments, as mentioned before, they should be rubbed for some time with a fine testaceous powder, such as I usually recommend, to remove whatever discoloring matter still remains:

then, when the enamel becomes perfectly clean, white and polished, even this fine powder should be used very sparingly, at distant intervals, and the color and smoothness are to be preserved by frequent brushing and washing.

It often happens that the enamel itself is tarnished throughout its whole substance, and that the removal of the tartar cannot give a fine color. In this case, the patient, if he be not well advised, continues the use of powders and tinctures, until the enamel is destroyed; or he goes to some ignorant operator, who, thinking the business not finished, nor his fee earned, until the teeth become white, employs his files and cutting powders, until the enamel is wholly destroyed, and until he exposes the naked tooth to a train of evils.

Having recommended, above, the use of instruments to remove tartar, in preference to any other method, it is necessary to set this matter in a proper light, and to remove a very ill grounded popular prejudice.

It is commonly imagined, that it is much safer and gentler to remove the tartar by means of tooth-powders, electuaries, and tinctures, than by means of steel instruments. To this it is only necessary to answer, that the enamel of the teeth is as hard as the hardest steel, and the edge of a steel instrument, sliding obliquely on it, can no more injure it, than the edge of a knife, applied in the same manner, can scratch a pane of glass. But that grinding powders, which cut the hardest steel, or that chemical liquors can destroy the enamel, is plain to daily observation and common sense.

The distinction also which I make between soft testaceous powders and the coarse emery or pumice-stone powders, commonly sold, is justly founded; because the former smooth the enamel, without grinding it away, after having removed the tartarous matter; but the latter cut it away quickly, and leave behind them a coarse and scratched surface, which favors the fresh growth and adherence of the same sort of matter.

CHAPTER VII.

Of Vegetable Acids, Sweetmeats, Violent Efforts, Picking the Teeth, Smoking, &c.

HAVING treated of the mineral acids, and endeavored to restrain the excessive use of them, I think it necessary to consider the *vegetable acids* and *sugar*, in like manner; since they have often been mentioned in the preceding parts of this work, and represented as hurtful to the teeth in some of their disorders, if not in their soundest state.

It does not appear by any experiments made on the human teeth, that vegetable acids are powerful solvents of the enamel; but since they are known to act on calcarious earths,—since they are found to soften bones and the shells of eggs,—and since they can often make their way to the naked bony parts of the teeth below the enamel, I think it is very obvious, that on these principles *they* may hurt the teeth; and the roughness, tooth-edge, and pain, which they excite, joined to daily observation of their destructive effects, prove clearly that they do. Hence it happens, that the inhabitants of the West India Islands, and of other southern climates, where acid liquors and fruits are used plentifully, very seldom have good teeth.

With respect to sweet-meats, it is not easily to determine how they act on the teeth, although the disagreeable sensation excited by them, and frequent experience prove that they really are injurious.

The chemists say, that since vegetable acids destroy the teeth, sugar may do the same, because it is an acid enveloped in oil, which it may readily quit to unite with the calcarious earth of the teeth. They add, that many mild liquors dissolve hard bodies; thus mercury dissolves gold; oil dissolves brimstone, lead, and copper; the weakest acids dissolve metals and stones; water dissolves salt, or the tartarous dregs of wine; and sugared solutions, which by a little warmth may soon be turned to an acid liquor, may easily be supposed capable of dissolving and destroying the earthy basis of the teeth: since they will destroy iron or copper even before they become sensibly acid.

Whether this be true or not; whether sugar acts by softening or corroding the bony fibres, or, according to others, by affecting the nerves, and bringing on internal disorders, or else by hurting the connection with the gums; thus much is beyond all controversy,—that sugared meats or liquors, render the teeth more susceptible of pain from slight impressions of cold or chewing, and that the people who eat most sweet-meats are the most subject to disorders and deformities of the teeth. The peasants and poor farmers suffer less in this way *than those of rank and opulence*, who eat of second courses; and I am credibly informed, that in the low countries, where sugar, tea, coffee, and sweet-meats are used to excess, the people, even at an early age, are remarkable for the badness of their teeth. It is, therefore, advisable to eat of them but seldom, and always to wash the teeth after them.

Cracking nuts is often hurtful to the teeth, by breaking the enamel; as is also the custom of some girls who cut the thread with their teeth when they sew, to prevent the trouble of taking up the scissors.

The boyish custom of raising weights with the teeth, and of carrying a table or chair in the mouth, is as dangerous as it is absurd, and therefore should not be attempted by any reasonable person.

As to the constant use of tooth-picks after meals, I am clearly of opinion that it is a very bad practice. For all tooth-picks, and particularly those that are made of metal or wood, by being often pushed between the teeth, destroy the gums, and widen the interstices, so as to furnish more convenient lodgment for the food, and render the custom of picking every day more and more necessary.

If people after a long habit cannot refrain from such practices, the tooth-picks made out of quills, or the slips of the Spanish thistle, do less injury to the gums than any others. But to those who are willing to follow the safest and most effectual methods, I recommend the use of the straight tooth-brush, which has the hair fixed in the end, somewhat like a painter's pencil. This sort of brush, if it be well made of short stiff hair, instantly removes whatever scraps of food have lodged between the teeth, and instead of hurting or pushing down the gums, gives a salutary stimulus, as we mentioned above, which encourages their growth and adhesion.

I observe in people who smoke tobacco constantly, that the enamel of the fore-teeth has many fissures, which run chiefly from the edge downwards; I am therefore inclined to think that smoking is hurtful to the teeth, although it be found serviceable in defluxions, on account of the discharge which it occasions, and on account of its sedative virtue. But whether this opinion be well founded or not, it is certain, that with those who catch the pipe between their teeth, the enamel in that part wears away remarkably, in process of time, by the constant friction of it.

CHAPTER VIII.

Of the Care and Treatment of the Teeth in old Age, and of Artificial Teeth and Gums.

THE diseases of the jaws, which generally attend old age, are recess of the gums, prominent teeth, loose teeth, and the loss of teeth; all which, together with the various methods of obviating them, or at least of checking their speedy progress, having been already considered, to avoid repetition, I must beg the reader to collect from each respective chapter on these subjects, whatever instructions may be found necessary and applicable in the present case; I shall only add a few words concerning artificial teeth and gums.

Although artificial teeth are evidently ornamental; although they give a healthy juvenile air to the countenance, improve the tone of the voice, render pronunciation more agreeable and distinct, help mastication, and preserve the opposite teeth from growing prominent; yet, many are prejudiced against them on account of some inconveniences which are often found to attend the use of them. For they are said to become very soon yellow and dirty:—to give a stinking breath:—not to sit easy on the gums:—seldom to stand firm:—and to loosen after some time the neighboring teeth to which they are fastened. Or, the hard ligature, which is commonly used, is often seen to cut very deep into the sound teeth.

It frequently happens, no doubt, that there are just grounds for these complaints; but they are generally owing to the fault of the artist, the negligence of the patient, or the want of proper instructions.

Artificial teeth formed out of soft bone or ivory, soon lose their color, but they may be made of materials which are more durable, and will retain the polish and whiteness for a long time; and the people who wear them, should be taught to brush them often with proper powders, and to avoid as much as possible red wines and staining liquors. With these precautions, and frequent washing, they never give a disagreeable smell to the breath.

Their not sitting easy on the gums is owing to their resting unequally on them, and to their not being well hollowed and formed to answer every prominence and depression of them.

Whenever it happens that that they do not stand firm, it is entirely the fault of the artist, who has not made them to fit exactly, or has applied the ligature injudiciously.

It must be acknowledged, that when an artificial piece is made too large, it is apt to bear hard on the neighboring teeth, and to strain them outwards. On the other hand, when it is made too small, the ligature draws the neighboring teeth inwards, and thence is apt to loosen them. But if an artificial tooth, or a piece consisting of several artificial teeth, is well fitted exactly to fill the void space, it rather supports the neighboring teeth, and preserves the corresponding ones of the opposite jaw from being protruded. Nor is this contradicted by the common observation, that the teeth often become loose and fall out quickly, even in those who use the best made artificial pieces, and who employ the most judicious dentists: because the same general decay or disorder, which made an artificial piece necessary at first, may easily be supposed, and is generally seen to attack the neighboring teeth; and they would be lost in turn, whether an artificial piece were used or not. Or, let us grant for a moment, that an artificial

piece, however well executed, is really apt to loosen a neighboring one to which it is fastened, in the space of five or six years ; can the consideration of such a loss justly out-weigh all the obvious advantages of artificial teeth ? or, is it a matter of great concern, if a man once in five or six years is obliged to have one added to the number of his artificial teeth ?

The complaint, that the natural teeth are cut by the ligature which is used to fasten artificial ones, is owing to the fault of those who apply wire instead of silk. Ligatures of wire certainly hurt the natural teeth very soon, but silken twist cannot affect them in such manner, in the space of a great many years.

The use of artificial teeth is not confined to the cases where there are natural teeth to which they may be fastened. A whole set of artificial teeth may be made for one or both jaws, so well fitted to admit of the necessary motions, and so conveniently retained in the proper situation, by the help of springs of a new and peculiar construction, that they will answer every purpose of natural teeth, and can be taken out, cleaned, and replaced by the patient himself, with the greatest ease. I say springs of a peculiar construction, because they are totally different in shape and action from those which have been used by my predecessors ; because they follow all the various motions of the jaw very freely ; and because the pressure, which they give, is always equal and gentle, whether the mouth be shut or not.

When the gums are uneven or fallen away, the patient may have recourse to the use of *artificial gums*. This term sounds strangely, and makes no small show in an advertisement. But the contrivance is nothing more than an artificial set of teeth, carved, and stained at the lower edge, to represent the healthy gums. The deception is certainly good, and answers the purpose so well, that no body in common conversation can distinguish the *artificial* from the *natural* gums.

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nomena with the least attention, it will soon appear that they are contrary to the natural history of the teeth. We know, for instance, that the teeth are formed at different periods, and that each tooth is planted and secured in its own particular socket; that, first, the crown of the tooth; and then the part constituting the enamel receives its formation; that the formation of both takes place a long time before the tooth protrudes through the gums and socket, and, also, in such a situation and under such circumstances as to render it quite impossible that any such union could take place during the time the teeth are concealed in the alveoli and gums: and when we consider the construction of the enamel itself, which entirely prevents its union with the neighbouring teeth after it has passed the gums, we have great reason to doubt the existence of examples of such *lusus naturæ*.

For my own part, I must declare, that during all my practice for many years, I have never been able either to obtain ocular demonstration of such a case, or to satisfy myself that there ever has been such a case. And this I say, also, of all my professional brethren with whom I have had an opportunity to converse on the subject. I hope, therefore, that my scepticism on this point will not be construed into a want of becoming respect for the authorities from which these cases are derived. There is no other way for accounting for such doctrine than by attributing it to a weak credulity, or love of the marvellous, or a desire to impose upon the world. Let us take into consideration one of these cases. Mr. Joseph Fox mentions an instance of this supposed union in two central incisors of the under jaw at their contiguous sides. See his *Nat. Hist. of the teeth*, &c. plate viii. fig. 8.

On a superficial view, the upper and under central incisors, as they are the only adjoining teeth in each jaw which keep pace with each other during the whole process of their formation, would seem to be the best adapted for such union and most liable to such irregularity. But on close consideration, great doubts of the facts will arise, if we call to mind the existence and nature of the symphysis between these teeth, by which the jaw is not united until sometime after birth, and consequently, not until those temporary teeth are perfectly formed, and the crowns of the permanent incisors much advanced in growth; and also when we consider that these teeth are divided by twice as much bony material as any of the other teeth, having each of them a separate socket which surrounds them on that side where the two sides of the jaw are united by the symphysis, and where they are the nearest to each other. The author gives no further account of this case, which I consider the most extraordinary of all the cases of irregularity related by him, and, therefore, most particularly worthy of attention. I, indeed, believe that Mr. Fox did not see himself the case he thus

describes; else he would assuredly have given a more circumstantial account of it.

Such cases furnish a fine apology to ignorant operators, and I have no doubt that the first case of this kind originated in some bungling accident or ingenious deception.

At the time when the formidable pelican, of which I have already spoken, was in more common use than it is at present, it may have sometimes happened that, instead of one tooth being extracted, two, three and four teeth were broken away by the violent application of that instrument. After the occurrence of such an accident the operator, having his reputation at stake, could not readily imagine a more plausible apology for his misconduct than that the teeth had grown together too intimately to be separated. In confirmation of this, he could exhibit to the patient, at the moment of his extreme agony and mortification, the teeth which he had broken out, and which at the time might certainly be united by a portion of the alveolar process, and appear to the poor patient at such a moment as one solid piece of bone. An excuse could easily be given for the non-production of the phenomenon, if it should be afterwards desired by the patient, as its loss or destruction by some pretended experimental process, &c.

Operators become, also, sometimes authors, and, in justice to their reputation, feel themselves bound to give a circumstantial account of all such cases, and these being naturally multiplied by the ignorance of other operators, become like legends and traditions on the monstrous productions of nature, wholly incapable of being refuted, not on account of their actual claims to credit, but on account of the number of believers in them. The story would thus become generally known and recorded, and would be cited in excuse for every subsequent disaster by other incompetent dentists.

I have always considered all such assertions as utterly false and contrary to good moral and professional principles, and during my long practice in the United States of America, where diseases of the teeth more frequently occur, and are more rapid in their progress than in any country of Europe, and where it might consequently be supposed that such cases would more probably exist, I have never met with a single case which could support, in the slightest degree, any such erroneous assertions; nor have I ever seen a tooth which could not be extracted by means of one or other of the instruments, which I have in my possession: and I have frequently removed teeth, the extraction of which had been declared impracticable by other dentists from some difficulties which appeared to them insurmountable, either at the first examination, or after repeated unsuccessful attempts to perform the operation.

It is a fact, therefore, proved, indeed, beyond any doubt, that the difficulties of the operation have rendered it so unpleasant to surgeons and even to dentists, not only to have frustrated every attempt to improve the implements for its performance, but to have placed it in the hands of persons totally destitute of the judgment required to determine on its expediency, and of sufficient skill for its proper performance. Hence arises the imperfect state of this important operation, its unskilful application, the dread and horror with which it is regarded by those who are in need of its remedial effects, and the appalling and dangerous accidents which attend and follow it.

Of these accidents the foregoing description is but an imperfect sketch, and in order to give the reader a more comprehensive view of them, I must refer him to the essay of *M. J. R. Duval*, a very learned dentist of Paris, entitled "*Des Accidents de l'Extraction des dens*;" where he has extensively treated of this subject, and has taken great pains to accumulate cases of difficult and unsuccessful operations and accidents accompanying them, which either have, or are said to have taken place from the time of Hippocrates and Celsus to the present century.

These failures and accidents he conceives to be the result of causes, widely different from those to which I have attributed them; and he endeavours to prove that all the dreadful and appalling accidents which follow the operation, are, almost invariably, unavoidable consequences of this formidable remedy.

Amongst many others, he enumerates broken jaws, loosened teeth, teeth violently forced into the jaw, the extraction of sound instead of the painful teeth, and in children the permanent instead of the temporary teeth, dangerous diseases of the maxillary cavities, wounded cheeks, and lacerated tongues. Even these are not the worst, he adds to them, not only the aggravation of all the diseases of the gums and sockets already existing, but also the production of *tic douloureux*, abortion, the interruption of periodical evacuations, dangerous and destructive diseases of the eyes, and even death, as not unfrequent consequences of this dreadful operation.

Having thus attempted to intimidate his patients and readers, our eloquent author concludes with advising, in a very sentimental and impressive manner, that they should endure every degree of torture, rather than suffer the extraction of a tooth; and that this terrible measure should be adopted only as the last resource, when the pain has at length produced utter despair, and entirely banished the sufferer's fortitude, and when the actual danger has become greater than the excessive hazard, as imagined by the author, attendant on the operation.

It is then, and then only, that in conformity with the opinion of Hippocrates, he considers the extraction of the tooth advisable.

The instrument to which he seems most favourably disposed, and which he would recommend, is of lead, such as was kept, according to a statement of Erasistratus, in the temple of Apollo at Delphi. Indeed the particular fondness of the learned author for the ancients, seems to have especially guided him in the choice of his theories and arguments, and, doubtless, were *his* system adopted, the art of the dentist would retrograde to *that perfection* in which it flourished between two and three thousand years ago, at Athens and Rome, and prodigious improvements might, doubtless, be expected from so scientific a return to those olden and golden times.

It must certainly be allowed, that M. Duval deserves great credit for the patience he has exercised in collecting so large a number of facts, so well calculated by his ingenious and eloquent representation to enable the ignorant operator to intimidate his patients, and offer ample excuses for any blunders, and the gross violations of the best principles of surgery and humanity.

Although he is a most industrious compiler and quoter, he has, by his dexterous and invaluable arguments and doctrines, secured himself against both the want of due reverence on the part of the great number of quacks, and the neglect of dental authors, and thus defended himself also against the application of the French proverb, "Ceux qui citent sans cesse, ne seront jamais cites."

Moreover, if M. Duval has been extensive in his practice, and popular as an author, and lecturer in Paris, he has, also, succeeded to admiration in producing and augmenting that excessive dread of the operation, particularly characterising not only his own countrymen, but even the people of the neighbouring continental nations, who are frequently supplied with dentists from the French metropolis: a dread which is not only seen in timid children and delicate females, but which, not unfrequently, disarms the most courageous sons of Mars and Neptune.

Such, indeed is the fact, and it is not less true than surprising that this almost insurmountable fear of the operation of extracting a tooth should have become so common amongst the French; a nation, certainly not deserving of the stigma of cowardice; but, on the contrary, highly distinguished for its valour and fortitude; and nothing can furnish a more convincing proof, not only of the great extent of the persuasive talents and influence of our author, but also of the baneful and destructive power of false prejudices, over even the strongest of human minds.

But it must also be added, that by the propagation of doctrines so exceedingly pernicious, not only great apprehensions have been excited, productive of much difficulty and anxiety both to the dentist and to the patient, but also not a small portion of human misery and distress have been diffused throughout a considerable part of Europe.

OF THE AUTHOR'S METHOD OF EXTRACTING TEETH AND ROOTS.

Practical remarks on the operation.

Having endeavoured to show, and I hope satisfactorily, the great importance of the operation of extracting teeth, by pointing out the various cases in which it relieves the most painful and dangerous diseases, and its great curative effects, not only upon the teeth, but upon the system in general; and having also placed the present imperfect state of this operation in a fair view before the reader, exhibiting to him some of the many injurious effects of its neglect or malperformance, it remains for me now to detail some of the remedies and improvements of my own practice.

The success of almost every surgical operation is, in a very great measure, dependant upon the judgment and skill with which it is performed, and thus the health or life of a human being may be sometimes preserved by an operation skilfully performed, which, if rudely or unskilfully managed, might lead to a greater destruction of health, or even a premature death.

The superiority of a surgeon, is chiefly founded on a better acquaintance with the diseases, which indicate, and with the parts, which are the subject of operations; and upon that manual dexterity, which is a rare gift of nature, and, though capable indeed of great improvement by experience and practice, can but rarely be acquired by labour, or any exertion. This fact may be applied particularly to the operation of extracting teeth. Simple as this operation really is, and although it is in many instances performed with much facility, it is, not unfrequently, opposed by almost insurmountable difficulties. Under such difficulties which often occur quite unexpectedly, the above qualities in the operator are unavoidably requisite.

A few anatomical and pathological remarks, which are immediately subservient to this operation, will not, I hope, be deemed here either useless or out of place.

The teeth are all, more or less, subject to the varieties of formation and size, which, although too numerous to be mentioned here, should be familiarly known to the dental surgeon.

The temporary teeth of the child, as well as those of the permanent set of the adult, differ, more or less, either as to formation or situation, in every individual, so that we cannot expect to meet with two sets of teeth precisely similar.

At the age of about six or seven, the healthy child, which has not lost any of the first teeth, possesses forty-eight teeth in its mouth; twenty of them, the temporary teeth, being completely formed and having passed through the gums; and twenty-eight, the whole permanent set, with the exception of the four third

large grinders or wisdom teeth, more or less advanced in their formation, either in the sockets beneath the temporary set of teeth, or about to protrude through the gums.

The incisors and cuspidati have but one root. The bicuspidati have either one or two roots. The large grinders of the under jaw, have generally two roots, which are short and thick: those of the upper jaw, have most frequently three fangs, which are longer and thinner than those of the under, and are often found to have grown in various and inconvenient directions.

The teeth are held by their roots or fangs in the alveoli, which are cavities particularly suited for their reception.

The roots are firmly attached to these sockets by a lining membrane, called the periosteum, constructed of a number of small but very strong fibres, that occupy the intermediate space between the inner surfaces of the sockets, and the roots of the teeth.

The periosteum is partly elastic, in consequence of which there is a small degree of articulation in every tooth. This varies, however, considerably, according to circumstances; such as, the greater or less length and number of the roots of the tooth; the age and constitutional strength of the individual; and the healthy or diseased state of the parts.

The external part of the alveoli is considerably thinner and much more elastic than the internal processes.

The upper jaw and sockets are of a more spongy and vascular structure than the under, which are consequently of a much denser texture than the upper.

Every tooth, both of the temporary and permanent set, has its individual socket, periosteum, and gums; and as these parts are intended solely for the support of the teeth, it follows that, if they are destroyed by disease, or by any other cause, the teeth dependent upon them must drop out. When the teeth are perfectly removed, these parts, being no longer requisite, are gradually removed by the natural process of absorption.

If, however, any roots or portions of roots are left in their sockets, this process is counteracted, and they produce, by their chemical and mechanical irritation, such inflammation and suppuration, as become sometimes, by their long continuance, very dangerous and destructive, not only to these parts themselves and to the teeth, but also to the general system.

The variety of the causes and kinds of diseases, the different forms, extent, and situation of the caries, the great difference in the size, formation, and muscular construction of the mouth and other parts, subsidiary to the functions and health of the teeth in different persons, are all circumstances worthy of mature consideration by the operator before he proceeds to operate.

A perfect acquaintance with the sensibility of the different parts is also very requisite, and will be a useful guide to the operator at the different stages of the operation. This knowledge will enable the dentist, when the pain is trifling, to proceed slowly and carefully; and, as soon as it is becoming acute, to complete the process as soon as possible, and thereby prevent unnecessary pain.

It is well known that the nerve of the tooth is exceedingly sensible, and that when in a state of inflammation, it is subject to the most acute pain. This painful symptom, the tooth-ache, is so generally known as to need no further description.

The periosteum, however, in a healthy state, I have always regarded as having but very little sensibility, from the circumstance of its being intended by nature to endure so great a pressure as it undergoes in masticating very hard and large substances.

Having had occasion to extract some of my own teeth, I have had the best opportunity of experiencing all the effects of the operation upon the patient, under all its circumstances and periods; and although my principal motive in having recourse to the process was the desire of getting rid of some troublesome teeth, yet I made it a matter of particular attention, as an opportunity for acquiring personal and experimental information on this point.

The teeth which I extracted from my own mouth were seven in number: six upper, and one under, large grinders. They were all very firmly seated in their sockets, and the upper had each of them three, and the under two roots. In the upper teeth, with the exception of one only, the caries had just reached the nerve, and the under was perfectly sound; so that in six of them no considerable inflammation existed, either in the nerve or in any of the surrounding parts.

The extraction of all the upper teeth was performed with the forceps, and very slowly, that I might be able to feel, and remember distinctly, the peculiar kind of pain attending each part of the operation in all its degrees. When I took hold of the tooth with the instrument, I felt no pain whatever; in moving the tooth towards the outer side of the mouth, it seemed to me that I could hear the gradual tearing of the periosteum on the inner side, and feel the crushing of it on the opposite side of the roots. This process was accompanied with little or no pain; but when the periosteum was perfectly separated and the different nervous cords were being torn off, I felt an acute pain of momentary duration, very similar to what I had experienced the evening before from the tooth-ache for at least an hour; and which was the cause of my extracting the tooth; I believe it was equally great,

but certainly not greater, and it was instantly over. The circumstances accompanying these operations, which were performed within a period of ten years, were so much alike that the above account will serve for all.

The removal of the second large grinder from the left side of the under jaw was performed on the 9th of July, 1824, by the instrument newly invented by Dr. Physick. The tooth was removed towards the posterior part of the mouth; and, when loosened, was extracted from the socket by means of the forceps. The pain was not greater than that which I had experienced in the extraction of any of the upper teeth, although the tooth was very firmly held in its socket.

The extraction of the first large grinder on the right side of the upper jaw, was performed on the 7th of January, 1825. The lining membrane having been previously inflamed, and suppuration having commenced, the pain was somewhat more acute than what I experienced in the removal of the other teeth, yet it was much more supportable than the tooth-ache.

Many of my patients, who have not been deceived by unnecessary apprehension and fear, have given me a similar description of their feelings at the time of the operation.

From my own experience, in connection with the above facts, I am induced to believe that the periosteum, in a healthy state, has little or no sensibility, and that the tearing of the nervous cords of the roots, while the tooth is alive and free from inflammation, is the greatest, if not the only cause of pain in the operation, and that the pain is generally of momentary duration only.

When the periosteum is in a diseased state, it is more sensible, and sometimes painful, and will generally be found relaxed and weak, and the tooth itself loose.

When either the nerve or periosteum is in a state of active inflammation, the pain of extraction is somewhat augmented; but the suffering of the patient from the tooth-ache is also so much greater as to determine him to submit to the operation, even more readily than in other cases.

When the tooth has lost its vitality by the destruction of the nerve the periosteum begins to decay; so that, after a time, the tooth is held only by the mechanical adhesion of this membrane to the roots, and by the contraction of the alveolar processes. When the tooth is in this state, no great sensibility can exist in the periosteum, and no pain can be felt in the alveolar process; so that the dead tooth or root might be extracted almost entirely without pain, if the alveoli and gums and contiguous parts were not more or less symptomatically diseased by the irritation of the dead tooth or parts of the tooth.

A minute knowledge and a quick conception of the above cir-

cumstances will enable the surgeon-dentist to decide at once on the mode to be adopted, and on the means requisite for proceeding in every necessary operation.

Of the performance of the operation of Extracting Teeth.

The removal of a tooth is effected by separating the periosteum from the alveolus, and by tearing off or dividing the nerve and its cords. To obtain this object with the greatest safety and least pain and injury to the patient, I have adopted the following principles and mode for the operation.

Every tooth or root is to be removed in a direction towards the outside of the mouth, if no particular circumstance exists to form an exception to this rule.

The tooth which is free from acute inflammation and pain, should be removed, first by a slow movement of it towards the outside of the mouth, just sufficient to separate the periosteum on the inner, and destroy it on the outer side of the tooth, and then by one quick firm traction, in a nearly perpendicular direction, to divide the nerve cord or cords. The whole time of the operation should be from two to four seconds.

When either the lining membrane of the tooth, or the periosteum, or both of them, are inflamed and painful, the periosteum and alveolar processes are generally more or less relaxed. Under such circumstances, it is advisable to perform the operation more speedily, and to do this effectually without inflicting any unnecessary pain, a very firm hold should be taken of the tooth, and by a slight lateral motion it should be extracted in the manner I have just described; the time employed should be from one to two seconds.

In the extracting of roots or stumps of teeth, as the life of their nerve and periosteum must in general be supposed to be extinct, there can be no sensibility in these parts; and the pain, if any, attending their removal, will be owing to the diseased or irritated state of those parts of the periosteum which belong to the sockets surrounding them. To occasion as little pain as possible, it should be the object of the operator to remove such roots or stumps with the least possible pressure on the surrounding parts. Great care and dexterity are required to secure this object.

If the roots are sufficiently strong, and so formed and situated as to be taken hold of by the instrument in the same manner as the tooth, they should always be extracted in the same way as the tooth itself when free from soreness and inflammation; and they may be thus removed almost entirely without either pain or difficulty.

Sometimes, however, these roots or stumps are found in so soft and putrid a state as to crumble away by the mere touch of the

instrument, and at other times so deeply seated within the socket that their existence is only known by the opening in the gums, or by the diseased state of the surrounding parts. In this state they are always very hurtful to the neighbouring teeth and other parts; and I have often found their extraction very difficult, but never impracticable. Their removal can always be accomplished by a division of the surrounding periosteum with some cutting instrument, and the application of a sufficient force afterwards, in the same manner as before directed. See Case 24.

On the other hand, when both the lining membrane and periosteum of the remaining roots or stump yet possess their vitality, as is generally the case for a short period after the accidental breaking of a tooth under the operation of extraction, the removal of the root or roots is sometimes accomplished with much greater difficulty, especially if the firm attachment of the periosteum to the socket is increased by some irregularity of the root or roots, and in these rare instances only, may a delay of the operation be necessary. In three cases only of this kind, during all my practice, have I been obliged to defer the operation for five or eight weeks; when it was accomplished instantaneously, and the hooked form of the roots proved to have been the cause of the difficulty which rendered its immediate completion impossible, but which after the death of the periosteum, ceased to be a sufficient obstruction to their complete extraction.

Of the Physical and Mechanical Means to be used in the performance of this operation.

It is the duty of the surgeon-dentist to be fully prepared for every emergency in this branch of surgery, inasmuch as he has made it his particular study, and professes to practise it exclusively; but especially for all the varieties of this operation, and with every instrument which it may be possible for him to require. It should always be considered as a golden rule, never to be departed from, that every dead tooth and root, and all such teeth as cannot be preserved alive, should be extracted; and that there should be no dissuasion, nor pretext, nor excuse of any kind made use of to avoid the operation. In all such cases, it should be the imperious duty of the dentist to recommend the extraction of all the affected teeth or roots, however unpleasant and difficult it might be to the operator. Actuated by such principles, and a sense of their great practical importance in dentistry, the surgeon-dentist will spare no expense nor time in the extension of its apparatus by any invention or improvements that may occur to him during his practice; for the assertions of those who pretend to remove all sorts of teeth and roots with only one instrument deserve as much credit as those of the impostor who pretends to cure every disease with

one infallible drug. They are both, indeed, instances of the most impudent quackery.

In every surgical operation, the first object should be, to place the patient in a proper situation; which should unite as much as possible, comfort to the patient, and convenience to the operator for the requisite speedy and adroit performance of his duty.

All operations on the head require a particular attention to this point, as it is the most important part, and contains the most delicate and most precious organs of the whole system; while operations on the mouth and teeth, in particular, are, in many cases, extremely tedious and fatiguing to the patient, as well as exhausting to the operator. A proper situation of the body and parts to be operated upon, will not only greatly diminish all these inconveniences to the patient, as well as to the operator, but will render the performance of every operation more certain and successful.

The less mechanical force is used in any surgical operation, the greater the safety with which it is performed. All unnecessary mechanical power should, therefore, be avoided in the performance of this operation; and every tooth or root should be extracted, if possible by physical strength only; in order that the operator might have an entire control over the process of the operation, whatever occurrences might present themselves during its progress. Every instrument used should be formed and constructed so as to bear as little as possible upon any other parts than those of the tooth or root intended to be extracted; and the fulcrum of the lever, as well as the moving power, should be in the hand, and exclusively subject to the will of the operator.

These objects can be obtained only by the possession of a great variety of instruments, each of which is especially adapted for some particular cases.

Of the Operating Chair.

A well-constructed operating chair is a very important part of the apparatus of a dentist.

In the beginning of my practice, I felt the want of such an instrument, and I consulted every author I could meet with, in the professions both of the dentist and of the oculist, for something of assistance in this matter, but without any success. I was therefore obliged, after much trouble and disappointment, to endeavour to invent an operating chair for myself.

This chair is one of the most important improvements which, I hope it will not be deemed presumptuous in me to say, I have made in the apparatus of the profession. It is susceptible of so many changes with great ease and expedition, and without the use of any complicated machinery, that it may be accommodated to the size of any patient, and to every position of the head necessary for

any process, and wholly supersedes the necessity of any services from assistants, which are both very uncertain and unsafe.

In most instances, the more difficult dental operations, which I am enabled to adopt whenever they are indicated, can be performed but very imperfectly, and frequently not at all, without the assistance afforded by this chair. For the extraction of teeth, its advantages are very evident in cases of difficulty. I have never found it necessary to place my patient in any of those unbecoming and inconvenient postures which are sometimes recommended and practised; such as, that of placing the patient upon the floor, or taking the head between the knees, &c.

For the removal of the upper teeth and roots I always make use of a high chair; and for the removal of the under teeth, of a low one, on which I place the patient with his head leaning back and resting against the head piece, placed in the most convenient direction.

Of the Forceps.

All such teeth and fangs as are sufficiently strong to afford a firm hold, I extract with the forceps or pincers: and, for this purpose, it is necessary to have instruments of this kind of different forms, sizes, and strength.

Of the Pyramidal Lever.

The removal of all fangs or stumps, which cannot be extracted by the forceps or pincers, I have invariably succeeded in effecting with the instrument which M. La Forge calls "*Le Levier Pyramidal*." This instrument is formed somewhat like a pointed gouge, and is attached to a handle like that of a punch. Its point is sharp in order to separate the periosteum around the tooth, and to lift it out of the socket after it has been loosened.

This instrument should be made of the best steel, so that it may be sufficiently hard to take a fine sharp edge, without being so brittle or hard as to break under the application of any power.

The dentist should be in possession of many kinds of this instrument differing in strength, size, and shape, so as to enable the operator to introduce the cutting point between the socket and tooth, and give a sufficient purchase to use it as a lever in lifting out the tooth or root.

Of the Instrument invented by Dr. Physick.

For removing the dentes sapientiæ and sometimes the second molares, I have occasionally used an instrument invented by Dr. Physick of Philadelphia; of which I beg to give a short description.

This instrument is in the form of a strong pair of tooth forceps: of which the parts which commonly form the claws are two blunt

blades, somewhat in shape like those of a pair of large nail scissors, and in an oblique direction.

The tooth is removed by placing the two blades between the tooth to be extracted and its anterior neighbour, with sufficient pressure to force the tooth towards the posterior part of the mouth, in order to destroy the periosteum; the tooth is then to be lifted out of its socket by the same instrument, or with another pair of forceps.

In these cases where the anterior teeth are sound and firmly seated in the sockets, and when the anterior part of the tooth to be removed is not too much destroyed by decay or caries, I have found this instrument very well adapted for the operation.

Of the Key and the Punch.

I have very seldom used the key and punch. I believe I may justly say, that in the last ten years I have not extracted fifty teeth with either of these instruments, although I have several different kinds in my possession. Nevertheless, in some rare instances, their use may be properly indicated.

Remarks on Instruments for Extracting Teeth in a perpendicular direction.

On a superficial view it might be supposed that the extraction of a tooth would be best performed in a perpendicular direction. The invention of instruments for this purpose has, therefore, been considered a desideratum by some of the most respectable members of the faculty; and some have been at great trouble in making improvements for that purpose. A more particular examination, however, of the subject will show the fallacy of such an opinion, and put a stop to injurious experiments.

By the perpendicular extraction of the tooth, the division of the nerve cords and of every fibre of the periosteum is effected at the same instant, by which all the pain is concentrated into the same moment, and hence is rendered exceedingly intense.

To effect the operation in this manner, the whole physical strength of one man would hardly be sufficient, and it would be requisite to employ a lever of great power, the fulcrum of which would necessarily be placed either upon the neighbouring teeth or upon the gums. The pain produced by this pressure of the fulcrum would be extreme, and felt also at the same instant as that caused by the extraction; so that the tearing of the periosteum, the breaking of the nerve cords, and the contusion of the surrounding parts would excite all at once a pain wholly insupportable, and incalculably greater than that attending the method which I have recommended; besides this, we must take into consideration the many disagreeable and painful consequences which, I may

say, would almost invariably happen to the teeth, periosteum, alveoli, gums and maxillæ, exposed to the mechanical influence of such operations; as the danger and destruction of these parts would be in proportion to the power applied for the removal of the affected teeth.

Indeed, to any one at all acquainted with the anatomy and pathology of the teeth and their gums, the notion of such a method must be an absurdity: whilst new implements made on that principle can only betray the ignorance of their inventors.

I have two instruments of this kind in my possession, one invented by Mr. E. M. Stoltz, of Cassel, and the other by Mr. Simpson, of this country. They are fine specimens of workmanship; but they are too complicated and too bulky for any operation; even though the objections above mentioned were not insuperable. They are, indeed, like Pindar's razors, more calculated for sale than use.

I am aware that any description of a dental apparatus must be exceedingly imperfect without plates; but as it is impossible to give engravings of all my instruments, many of which are entirely new, and others greatly improved, in consequence of the great delay and expense which would necessarily be incurred, it is needless for me to attempt any further description.

The number of my instruments for this operation, is upwards of eighty, of which more than two-thirds are actually indispensable to do any justice to this important remedy. Indeed, my apparatus, in consequence of its extent, and on account of its great difference from what is generally used, would not only be dangerous in the hands of the ignorant, but its judicious application would require some previous practical instruction even on the part of the scientific dentist. This, I hope, will be deemed a sufficient apology for my not giving any further description, at least at present: I hope, however, I may have an opportunity of doing so at some future period.

Of the moral means subservient to the due performance of the Operation of Extracting Teeth.

Having endeavoured to point out the surgical means requisite to enable the dentist to meet all the difficulties which may occur in the performance of this operation, and to perform his duty with the greatest care and safety, I have now to allude to other circumstances which also claim great attention: viz. those of a moral nature, which are often as important as they are perplexing and discouraging.

Of the Impropriety of applying Force.

It is a practice universally adopted in surgery, when an operation is to be performed, to apprise the patient of its necessity, and

to give him an opportunity for a deliberate consideration, in order to decide for or against its performance; or, if the patient be a child, or otherwise incapable of determining for himself, the parents, guardians, or friends are consulted. The same practice may also be adopted by the surgeon dentist.

When the patient has decided on submitting to the operation, the prudent surgeon will take care to provide for, and prevent every possible contingency that may delay or interrupt its performance.

As soon as the surgeon has commenced any operation, the process should be no longer subject to the interference of the friends or patient, who, having acceded to it, the latter must submit to its accomplishment, and, in case of necessity, should be prevented by manual or mechanical assistance, from exerting any voluntary or involuntary impeding or resisting force.

This precaution is of the greatest importance, both for the patient, and the general surgeon; of which, however, the dentist is altogether unable to avail himself. His situation is very different, and much more dependant and precarious. He can use no mechanical means to prevent interruptions offered by his patients, or to hinder their putting a complete stop to these operations before they are completed.

This difficulty places the successful treatment of a case, and not unfrequently the comfort of a patient, and the reputation of the dentist, in a very dubious situation.

When it is required to extract only one tooth, this difficulty may be in a great measure avoided by the method of performing the operation which I have recommended; as, in that case, the patient has not much opportunity to interfere when the tooth has been well taken hold of by the instrument.

When, however, many teeth and roots are to be extracted, as often happens from previous neglect, or bad treatment, and the whole set of teeth is in a situation of great danger, such a difficulty may be occasionally apprehended.

If, in such cases the patients were held, as would only be possible in cases of children, the operation would be rendered an object of more dread than it is at present: and, as on children it must necessarily be repeated at intervals for many years, the terror of it would render the sufferer more miserable at each successive operation, and the operation more insupportable to the patient, and more difficult to the dentist.

Little benefit, however, would be gained from the application of force; for, although the patient's head might be held immovably, yet it would be extremely difficult, if not impossible, to prevent him from shutting his mouth, except by some mechanical means, such as, a gag, or some other powerful instrument, which method

of course should not be adopted, on account of the disagreeable and even dangerous effects which might arise from its application.

But it is a matter of the greatest consideration, that all such means would make the operator rather an object of terror and hatred than of regard and affection to the child, and the dentist who will not endeavour to profit by the disposition in the youthful heart to attach itself to whatever it has need of, will miss a powerful auxiliary, particularly in the application of this surgical remedy: the proper moral means, reasoning and kindness, will do more than force with every human being, but especially with children. Obtain their confidence and affection, and you may do any thing with them that benefits their moral and physical welfare.

Of the impropriety of using deception.

The use of deception, which I am sorry to say is not unfrequently practised by operators on the teeth, is not less objectionable than that of force.

It may be serviceable with children in the first operation, but can never be repeated, and is a great disadvantage in the conduct of succeeding operations.

It prevents that confidence which should encourage the little patient, and enable the surgeon to act freely. It is also very irritating to the self-love and pride of the young individual, which should rather be stimulated by the judicious dentist, and be used as a chief governing power over the apprehensive mind of the child; whilst any humiliation of that feeling should be avoided, as it will never fail to produce a degree of resentment in the tender heart, however adroitly the deception may have been practised. It deprives the patient of every opportunity for gaining credit for the display of courage and fortitude, and is especially mortifying to those who are solicitous of distinction for courage, as generous-minded children always are.

I have frequently found that I could entrust such becoming pride with much more confidence than any kind of deception, especially with children, and weak and faint-hearted people.

In short, the dentist should at all times disdain to use any deception or force, and should consider either as wholly unworthy of an intelligent surgeon, as well as injurious to the patient; as neither will ever inspire the latter with the necessary steady and composed resignation, which must be founded on unlimited confidence, and obtained by upright conduct only.

I do not wish, however, to be understood, that parents should not exert their authority at a time when the future health of their children is the object of serious consideration. Indeed, the greatest assistance may be expected from a judicious and positive interference on the part of a sensible parent, relative, or friend;

whilst nothing can be more inconsistent or more unbecoming, and even dangerous, than the expression of fear and false affection by any of the bystanders on these occasions.

By such interference at so critical a moment, I have sometimes seen the best plans for a permanent cure totally frustrated, when this conduct could not fail to become the cause of protracted misery and pain to the child during the whole of its after life.

Sometimes, when the constitution is affected by a number of decayed roots and teeth, and the local and general effects are rapidly proceeding to destroy the remaining useful teeth, and to injure the general health of the patient, the difficulties ensuing from any interruption to the discharge of his duty, must naturally be very disheartening to the humane operator, who feels for the suffering individual the interest necessary to insure success under such difficulties. It is, nevertheless, at this moment that he must reasonably expect to encounter such interruptions and difficulties on the part of delicate and nervous patients, particularly if the patient be a lady or a child. The whole system may be so affected by a long continuance of delicate health, or a high degree of nervous irritability, as to cause the greatest apprehension, and induce the false belief of inability to undergo the operation, however the inclination may favour the intention. The pain of the operation will be considered more, and the power of supporting it less, than it really is.

If, under these circumstances, a considerable number of roots and teeth are to be removed, much ingenuity and judgment are required to enable the operator to proceed without interruption; inasmuch as the most trivial accident may defeat the accomplishment of the operations.

These are, indeed, cases in which the greatest professional skill and the utmost delicacy and gentleness are required, added to an intimate knowledge of the human heart; yet the dental surgeon, possessed of these moral qualifications, will never require the use either of force or of deception, but will obtain, by the influence of his character, the confidence of the most delicate and timid of his patients. See the Cases 10, 12, 13, 14, 16, and 17.

Concluding remarks on the author's method of Extracting Teeth and Roots.

During a practice of many years, I have invariably performed this operation upon the principles, and in the manner here recommended. I need not say, therefore, that I consider it to be the best calculated to prevent every unnecessary pain, and to render what is unavoidably incident to the operation so very supportable, that I have, in almost every instance, succeeded in removing all such teeth and roots, as required to be extracted, at the same

time or sitting, even when the number of such teeth has been considerable.

The pain of the operation is, indeed, so much less from my method of performing it, and the fear of it also so much diminished, that I have often extracted at the same sitting, in a space of time not exceeding fifty minutes, ten to twenty-two teeth and roots from the mouth of the same individual without any such unpleasant consequences as frequently follow the usual mode of performing the operation, even after the extraction of only one tooth. See Cases 9, 10, 12, 13, 14, 15, 16, 17, 18, and 19.

At Philadelphia, in the United States of America, the advantages of this method have been proved in the clearest manner; so that I do not hesitate to say, that the operation in general is there no longer considered as a matter of an alarming nature, even by the most delicate of the well informed members of society, but simply as one of those vexations of life, which are to be met, not with serious preparation, but with a good humoured smile. It is an operation rather sought for than avoided, if necessarily indicated; and when it was judiciously recommended, it was generally submitted to without any hesitation on the part of the patient.

The happy effects it had upon parents and the elder branches of a family were sure to influence the children: from one family they extended to another, and even from one city to another; individuals have consulted me at Philadelphia, who had travelled a distance of from one to thirteen hundred miles, with a view, not merely to submit to this operation, but to ask for advice and assistance, as it related to the other branches of the profession of the dentist. See Cases 14, 15, 17, 18, and 31. This may be said, not only in corroboration of the fact already stated concerning the practice itself, but also particularly to show the inestimable value given to sound and beautiful teeth in the opinion of the well informed classes of Americans.

The multitude of frightful stories concerning the pain of this operation, and of the accidents so frequently resulting from it, were entirely disregarded and forgotten; and children began to consider the regular attendance of the dentist as a necessary part of their physical education: and I have frequently found them more willing to visit the dentist for the purpose of submitting to his professional duty than to study a tedious lesson. In many large families, boarding schools, and other establishments for youth, where I have been the regular attending dentist, I have found this operation so seldom regarded with fear, that it has been no uncommon occurrence to be visited by some of these little children, of the age of from four to nine, to request me in the name of their parents to examine their teeth and remove such as I should think proper. I have known this to occur when the little

creatures were too small to reach the bell or knocker, and were obliged to request some passing person to give the signal for them.

These are affecting instances of youthful confidence, and, simple as they are, they shew, what nothing else would prove so well, with how much indifference the pain attending the extraction of teeth may be regarded even by children, if the mind is not misguided by false prejudices and deceived imaginations. I hope, therefore, these remarks will not be deemed unworthy of a place here: for my own part, I have never considered such facts beneath the dignity of science, in as far as they may be highly useful; and I have always remembered them with particular pleasure, as bearing the most unquestionable testimony of the affectionate consideration of those, who are never to be thought of without emotion, the helpless and the delicate.

They are the strongest proofs of the extreme magnitude of moral sufferings in comparison with those of a physical nature, and how very trifling and supportable, even the greatest bodily pain, especially those of curative operations, might generally be rendered by a proper exertion of the mind, and by a judicious excitement and direction of its energies and powers on the part of the operator, and the friends of the suffering individual.

In illustration of these remarks, I beg to relate one case which occurred to me not long before I left Philadelphia.

CASE XXXIV.

When my determination of revisiting Germany in the spring of 1822, on account of my health, became generally known, I met with so many affecting proofs of confidence from families, and parents, and children, as almost to prevent my departure, I cannot permit myself to say any thing more on the subject in this public way, nor should I mention it at all, were it not a consolation and relief to my own heart, and at the same time I hope, a proof that I was not insensible to such kindnesses. Although the time fixed for my departure was the spring, I was detained by consultations and important cases until the autumn, notwithstanding my eager endeavours to escape from both.

Among other families who came for a final consultation, was the very amiable and numerous one of Mrs. C. to which I had been the attending dentist for several years. The health of this excellent lady was delicate, the nature of her education had not been such as to have prepared her for encountering severe trials; and her situation in life was such as, but for her delicate health, might have been regarded as one of the most enviable on every account among women.

I examined the teeth of all her daughters, and found them all in a healthy state except those of the youngest, who was about ten

years of age, several of whose incisors I discovered on minute examination to be carious, and I proposed to remove the caries with the file, and to extract the four first large grinders, in order to prevent a recurrence of the disease, which had arisen from some irregularity in the teeth, owing to their crowded state.

The poor child was greatly alarmed at this advice. Her eyes filled with tears, although her sisters, who were more familiar with the operation, were whispering to her to be of good cheer. The affectionate mother was much grieved at the discovery, and the struggle between her good sense on the one hand, and her parental anxiety on the other, was so affecting, that I proposed another plan, by which I should be able to save all the teeth of her daughter. But to this proposal she would not consent, declaring that she was convinced my first advice was the best, and adding that she and her daughter would submit to the operation first proposed; desiring only a little time for preparation.

About a week afterwards, the little girl called upon me in excellent spirits; and after expressing her sorrow for not having submitted to the operation immediately, stated that her reluctance had principally resulted from the alarm of her mother, who had continued, ever since I last saw her, to express her wish that the operation should be performed, but had not courage enough to agree to its performance. She, the daughter, therefore, had at last resolved to come to me, without the knowledge of her mother; and having acquainted me with the circumstance, she sat down with sparkling eyes and a smiling countenance, and said, "Now, if you please sir, I am ready."

I shall not attempt to describe my feelings on this occasion: but merely state, that in less than five minutes the four permanent first large grinders, the largest teeth in her mouth, were wrapped up in a piece of paper, and she went away with them in her hand, rather dancing than walking, to surprise and relieve her anxious mother from fear and apprehension.

I leave to parents, and particularly to mothers, to judge of the mother's feelings for so amiable a daughter.

In my circle of practice in Philadelphia, it seemed that reason had entirely overcome the impression of fear; an affection, indeed, which frequently makes imaginary pain appear real; and I deem it my duty, in justice to the American ladies, and particularly to those of Philadelphia, to pay my small tribute of praise to their patience and fortitude, a feature no less beautiful and virtuous in the female character, than true courage is in that of our sex.

The climate of the United States of America being unfavourable to the health and preservation of the teeth, these ornaments of the mouth, when beautiful and sound, are more highly esteemed

there than in any other part of the world, as far as my experience enables me to judge; and it is but justice to say, that the inhabitants of that country are ready to use every exertion, and submit to the most painful and tedious operations as soon as they are convinced of their efficacy. I have been very rarely unsuccessful in inducing my patients to submit to the extraction of all such teeth as I considered necessary; at the same time I have seldom met with any continued opposition, even in cases requiring this operation to the greatest extent. Indeed, so entirely have I found all fear of this operation abandoned by ladies, that I have sometimes met with considerable difficulty in persuading them to retain teeth partially affected, and such as I deemed proper to be preserved; and I have even been obliged peremptorily to refuse their request, when they have desired me to remove teeth under such circumstances.

Having, in the foregoing pages, strongly recommended the operation of extracting teeth in opposition to the practice generally adopted, and against vulgar prejudices, founded on a want of sufficient practical experience, or sinister motives on the part of certain unworthy members of this profession; I hope it will not be considered that I have any particular predilection for this operation.

From the causes I have exhibited, which so universally produce great dread of the operation, it seems evident, that there is scarcely an operation which, from its frequent necessity and innumerable difficulties, is more disagreeable and vexatious to most patients, and more unpleasant to the feelings of a humane operator than that of extracting teeth; for which reason, perhaps, no operation is less appreciated, and less calculated to be unnecessarily recommended. No dentist of common sense would ever act more against his own interest and feelings, than in advocating this operation without being convinced of its utility, and of its being his proper duty to perform it.

Had Peter the Great himself been a professional dentist, I am strongly inclined to think that his sanguinary passion for the pastime of extracting teeth would have been soon extinct; for he would have found little gratification in it, except such as was entirely in opposition to what was most acceptable to that cruel monarch; but which the humane operator cannot fail to enjoy, when he has fulfilled a disagreeable and painful duty for the lasting felicity of others, sometimes not without the sacrifice of his own more obvious and immediate interest.

I wish it to be distinctly understood, that no member of my profession, I am convinced, can have a greater regard for the real interest of his fellow creatures, and no one can consider the loss of teeth as a more serious deprivation, than myself. I have

always considered it the moral duty of the honest and enlightened dentist, to feel as much concerned and interested for his patient, when performing this duty, as the surgeon, when called upon to amputate an important limb. Nothing but the object of preserving health and life can justify the proceeding either of the surgeon or the dentist.

But the best results are rarely obtained by pleasant means; and they never can be obtained in dental surgery by such remedies as are in vogue at present. As different as my practical principles are from those commonly adopted, so much I am convinced are they promotive of the permanent interest of the patient, and satisfactory to the feelings of the conscientious dentist.

Whenever the operation of extracting teeth is performed on the principles, and in the manner I have stated, it is one of the principal means in the hands of the surgeon dentist of effecting a permanent cure of the diseases, and of preserving the health of the remaining teeth, as well as all the parts connected with them, and thereby to prevent the necessity of a repetition of this remedy.

This operation would, indeed, be rendered almost entirely unnecessary in the adult, if it was always performed when properly indicated in conjunction with other measures, proper to be observed in the treatment of the diseases of the teeth of children, preparatory to, and during the period of their shedding them.

The ignorant mechanical operator would, in this case, be obliged to resort to some occupation more fitted to his capacity, and more useful to society; and his artificial teeth, now so frequently rendered the greatest cause of destruction and disease, would be no longer in request; and thus one of the most powerful causes of the maladies of teeth would be altogether avoided.

Such an expectation, however, I fear we dare not indulge at present, and we must, with christian forbearance, only pray for such persons in the mild language of Christ himself: "Father forgive them, for they know not what they do."—Luke xxiii. 34.

CHAPTER V.

OF THE TREATMENT TO BE OBSERVED AFTER EXTRACTING TEETH, AND OF THE ACCIDENTS INCIDENT TO THE OPERATION.

THE after treatment of this operation, when judiciously performed, is generally of a very simple nature.

The cases of accidental injury, however accompanying or following its improper performance, are both very numerous and various. Some of them have been stated in the foregoing chapter; but to give a full view of all these distressing consequences, would far

exceed the limits of this essay. Their treatment must be agreeable to general surgical principles, according to the nature of every particular case. The present chapter however, will admit of only a few general remarks on the subject.

Of the after treatment.

It has always seemed to me, that in the treatment of all fresh wounds, every debilitating cause must directly interfere with that process of nature, by which health is gradually restored to the wounded parts, and that the application of any powerful excitement must be injurious and destructive; and my experience has convinced me of the truth of this fact.

The common practice of applying cold water, or water and vinegar, or any other more astringent fluids, as well as brandy and water, or other more stimulant lotions, immediately after this operation to the wounded parts, I have observed to be almost invariably productive of injuries; such as inflammation, swelling, sudden mortification of some parts of the gums, and sometimes hæmorrhage; and these generally accompanied with much pain; whereas, by the most simple treatment, such effects have been almost invariably prevented.

Fully convinced of the above principles, I have made use of warm water alone, and of such a temperature as would produce no painful sensation upon the wounded parts; and, in most instances, the only future treatment requisite has been as much attention as possible to the cleanliness of the mouth.

If, however, a great number of teeth and roots have been extracted, or the previous diseased state of the parts has been such as to require more active treatment; some slight astringent or stimulant lotions may be used with advantage on the day after the operation, and continued for sometime afterwards with a view to assist absorption, and to promote the recovery of the wounded parts; but it should be always used warm and of very moderate strength; for the application of cold fluids, as well as of powerful stimulants, will always prove injurious, and more especially if tartar or any thing else should obstruct the progress of the absorption of the gums and alveoli.

The use of warm water, I believe, has been adopted in amputation and other surgical operations, by some of my medical friends in Philadelphia, amongst whom I may mention Dr. G. M'Clellan, who has assured me of the salutary effect of its application during the performance of these operations, and of its great efficacy in lessening the pain and danger.

Of the treatment or fracture of the tooth.

The fracture of the tooth during its extraction is very frequently owing to an unskilful performance of the operation; sometimes,

however, it cannot be prevented by every possible care and skill. In cases of this kind, it is only necessary to remove immediately the remaining stump or roots in the manner stated, and no other other unpleasant consequences than a momentary prolongation of the operation will be the result of such an accident.

The dentist well acquainted with this operation, and prepared for its performance, will hardly ever fail to accomplish this object; and he should never allow himself to be prevented, nor desist until every exertion in his power shall have proved fruitless towards its attainment.

Should, however, the immediate removal be impracticable, which can only be ascertained after every means for its accomplishment shall have been employed, the operation may be delayed for five or eight weeks, when the surrounding parts will become more relaxed, and the removal of the stumps or roots may be accomplished with facility.

This difficulty is, however, very uncommon. During a practice of fifteen years, as has already been stated, I remember only three cases in which I found it requisite to propose such a delay; and in these few instances it was always proved by the ultimate removal of the remaining parts of the tooth, that some considerable deformity of the root or roots had rendered their extraction impossible at the former period.

Of the treatment of Fracture of the Sockets and Maxillary bone.

By extracting teeth in the manner I have described in a previous part of this essay, it will very rarely happen that any injury is done either to the socket or to the surrounding parts of the tooth extracted; sometimes, however, a small portion of the socket may be withdrawn in adhesion with the tooth, but this accident is attended with no injurious consequences whatever, and is even seldom distinguished by the patient. It requires no other treatment than the removal of the sharp or irregular corners of the remaining part of the socket, in order to prevent their irritative effect on the gums, and to facilitate the absorption of the remaining parts of the socket.

When, in consequence of the application of improper instruments, or from their mal-application, or from any other cause, considerable parts of the socket and jaw-bone should be removed, the same treatment should also be observed, only with the additional use of a stimulant lotion, mixed with some mucilaginous substance.

Of the mistake of extracting the sound instead of the diseased tooth, or a permanent instead of a temporary tooth.

Nothing can excuse the mistake, sometimes committed by unskilful and timid operators, of extracting an useful instead of a

diseased or painful tooth, or of any tooth the extraction of which is not indicated. This can arise only from a total want of qualification for the performance of the operation.

When it does occur, however, the operator cannot do less than acknowledge his mistake, and immediately endeavour to extract the painful or right tooth also. Nothing will more augment the evil of the first error, than the attempt to remedy it, by one far more dangerous and pernicious, namely, the replacement of the extracted sound tooth, which is not an uncommon practice adopted after such an accident.

Although it sometimes happens that a reinserted tooth, after much pain and trouble, becomes reunited with the periosteum, and thus mechanically retained in the socket, yet the nerve-cord of the lining membrane never unites, and the tooth, being consequently deprived of its vitality, must produce very great irritation.

In every instance in which I have seen this practice adopted, the replaced tooth always produced almost the same morbid effects upon the other teeth, and, indeed, upon the system generally, as is produced by the operation of transplanting teeth, such as, a general diseased state of all the other teeth and their relative parts; and, at length, a gradual destruction of the teeth, and of much of the substance in the neighbourhood of the reinserted tooth, as well as very great nervous irritability, and general delicate health.

The morbid effects of such a tooth are so great, that it is not uncommon, from the much more rapid progress of all the diseases of the mouth, to see almost every other tooth destroyed by caries before the chemical powers could remove the reinserted dead tooth by corrosion: hence the very common event of such a tooth remaining longer than the rest; a fact which frequently deceives the superficial observer. I have seen several cases of this kind during my practice, and, in all of them, the effects were more or less similar to the following Cases, No. 35 and 36.

CASE XXXV.

Miss S. of Reading, Pennsylvania, about sixteen years of age, was at one of the first boarding schools in Philadelphia. She consulted me on January 15th, 1814, and informed me that about three years previously, she had the right upper first bicuspid extracted by mistake. It was replaced, and it apparently adhered firmly to the socket. In consequence of the irritation produced by this tooth, one half of her teeth had been already either extracted, or destroyed by caries, the remainder were more or less in a state of decay, and her breath had the most repugnant smell imaginable, being precisely like that of a putrid corpse.

I extracted the reinserted tooth, which was in a very putrid

state, and seven other dead roots and teeth, and by these and other necessary means, her mouth and remaining teeth were restored to complete health.

Of the treatment of hæmorrhage from the socket following the extraction of teeth.

This accident is, most frequently, the effect of improper performance, or after management of dental operations; but it may also take place without the occurrence of either of these causes.

Critical bleeding from the socket, after the extraction of a tooth, is produced by a laceration of some arterial branches, of which the orifices have not sufficient muscular power to contract.

The violent and mechanical causes of this accident have already been explained in the foregoing chapter; and to these may be added, a relaxed or diseased state of the gums and sockets, as also irregularity and deformity of these parts, and of the teeth, augmented by delicacy of constitution, or by a scorbutic or plethoric habit of body, which, more or less, predispose the parts to such a hæmorrhage.

These predisposing causes may be much excited by an injudicious management of the operation. The usual practice of applying cold water, or powerful astringents and stimulant lotions, with a view to prevent the natural bleeding, may frequently excite hæmorrhage in cases already predisposed to it; because, although they act as topical astringents or stimulants for a short time, and prevent the bleeding, they seldom fail to produce injurious effects afterwards.

The wounded blood-vessels, being deprived of their natural relief from free bleeding, become enfeebled by over distension, so as gradually to lose the contractile power of their orifices, and thus the adhesive inflammation of the first intention is interrupted and changed into a morbid action, and a critical bleeding from the parts is the consequence.

Taking these causes of hæmorrhage into due consideration, it is evident that the application of lotions, either of a very powerful tonic or stimulant nature, must be highly improper, and that they must greatly augment the danger, not to add that the application of concentrated acids, caustics, or actual cautery, might be as injurious to the general health, and even life of the patient, as they must prove destructive to the affected parts.

In all the cases of hæmorrhage after the extraction of teeth, that have occurred in my own practice, as well as those which I have seen and read of in the practice of others, I should have deemed it contrary to good surgical principles to use any of the above powerful and destructive applications, especially the actual cautery.

In consequence of the almost inaccessible situation of the bleeding vessel, which is generally surrounded by some of the bony structure of the jaw, it is either altogether impossible to apply these means, or the application is attended with immense irritation, and also of destruction of so great a portion of the surrounding parts as greatly to augment the inflammation: and, if even a temporary arrest of the hæmorrhage be effected by the mechanical pressure of the dead parts destroyed by these means, the morbid state will prevent an union of the orifices of the ruptured vessels, and a relapse of the bleeding must necessarily occur, which may ultimately prove fatal to the unfortunate patient.

There are several cases on record and well-known in London, which would prove the inefficacy of such treatment: but, from their fatal termination, delicacy and forbearance prevent me from making any further reference to them.

This accident may be generally prevented by a careful performance of the operation, and by encouraging the natural bleeding, following the extraction of a tooth, by the free use of warm water only; and in cases where a hæmorrhage is apprehended, by the use of the water as warm as the patient can comfortably bear in his mouth.

The surgical means that should be employed, and principally depended on for stopping the bleeding, is mechanical pressure, and I confidently assert that if this simple remedy is judiciously applied, it will never fail to prove perfectly successful; and will not only render the accident harmless, but even in those instances in which it is not occasioned by an improper operation or unnecessary violence, the bleeding will be productive of beneficial effects to the diseased state of the mouth, as well as to the constitution generally.

By a strict adherence to the above simple method of treatment, it has been a very rare occurrence in my practice, to meet with any instances of this kind; indeed, it has never occurred in cases where a considerable number of teeth have been extracted at the same sitting; and, in the few instances in which I have met with it, I have always arrested it without any difficulty, by the above means, at any moment I deemed most proper.

During a period of fifteen years, I have seen but six cases; of these, four only occurred in my own practice, the most important of which I beg to relate.

CASE XXXVI.

Mr. G. a German gentleman in Philadelphia, consulted me, in 1812, about his teeth and gums, which were in a state of general disease, and rapidly decaying. He gave me at the same time the following history of a hæmorrhage from the extraction of two of his teeth, which had greatly endangered his life.

In consequence of tooth-ache, he was induced to request the extraction of the upper second large grinder of the left side. The operation was performed with the key instrument. In consequence of the imperfection of the instrument, and, perhaps, also of its unskillful application, the tooth in question, together with the third large grinder and a considerable portion of the sockets, were taken away at the same time. The pain was excessive, and the hæmorrhage so great as to render the situation of the patient very dangerous.

Dr. Physick was called in, at a time when immediate assistance was of the greatest importance. He immediately inquired for the removed parts, which were given to him in the state in which they were when removed by the instrument. After having cleared them and the wound from coagulated blood, he inserted the tooth and adhering parts into their original places. The bleeding immediately stopped; the patient was fed on spoon victuals and kept very quiet, laying on his back for some weeks, in order to prevent any obstruction to the adhesive inflammation and union of the parts, and to avoid irritation. The gentleman soon recovered; and probably owed the preservation of his life to the prompt assistance of this very eminent surgeon.

I was particularly struck with this expedient, so immediately successful, but was not so perfectly satisfied with its ultimate effects.

By a particular examination of the teeth, I observed that the reunion of the teeth and other replaced parts with the alveoli and gums was imperfect, and that the irritation thereby produced kept the surrounding parts in a state of constant inflammation and suppuration. The gums were red and tender, and the reinserted teeth, not having recovered their vitality, were so decayed that nothing but the roots remained.

The teeth on the opposite side were nearly in the same condition, all the other teeth were rapidly decaying, and the parts connected with them much diseased; but what was still worse, the individual, in consequence of the recollection of his original danger and suffering, could not be persuaded to permit the extraction of those stumps and teeth, which were not only the source of the irritation, but also very injurious to his constitutional health. Every plan, therefore, that I proposed for the restoration of health to his teeth and gums was rejected, from his groundless apprehension.

It is a singular fact, that not long after this consultation, a case precisely similar came under my observation; and it is on account of the uncommon similarity of the two cases, as well as on account of the judicious and very sagacious treatment adopted by Dr. Physick, that I have taken the liberty of relating the above.

On the 13th of May, 1813, I was sent for at eleven o'clock at night to see Mr. P. of Philadelphia, whom I found in state of syncope, owing to a profuse hæmorrhage from an alveolar cavity after the operation of extraction. About ten o'clock that morning, in an attempt to extract the upper second large grinder of the left side, both that tooth and the wisdom tooth, with a considerable portion of the sockets and gum of the same side had been removed. The bleeding had been profuse; but it ceased in a few hours until the evening, when the hæmorrhage returned, and became so great as to cause fainting twice before I arrived.

Having ascertained the nature of the cavity, by examination of the parts which had been removed, which were precisely like those described in the above case of Mr. G. I washed the wound with a lock of cotton dipped in warm water, and then inserted a lock which had been dipped in a mixture of five drops of sulphuric acid and a wine-glass full of warm water. I took particular care to press it well into every part of the wound, and to place upon it several other locks until the cavity was filled; and then to apply several cotton compresses between the wound and the under teeth; so as to obtain a pressure by the shutting of the mouth to prevent the passage of any blood. The mouth was kept in this position by a handkerchief bound about the jaws and head.

The hæmorrhage immediately ceased: the patient was put to bed with the head resting upon a high pillow, and particularly desired not to disturb the morbid parts.

July 14th. About twelve hours after the bleeding was stopped, the patient was weak, but otherwise perfectly well. The cotton forming the large compress over the wound was removed, and the patient desired to keep himself quiet.

July 15th. I found the patient perfectly recovered. The cotton came away altogether in the course of the third day; and the absorption of the remaining parts of the sockets, and the healing and cicatrization of the gums took place gradually and in the usual manner.

For many years after this period the patient enjoyed his ordinary health, and all his teeth remained perfectly sound. He never lost another tooth during his life either by extraction or decay.

The uncommon similarity of these cases does not, however, end here. The accident that occurred, as has been seen, was almost precisely the same in each; the patients were also nearly of the same age, about twenty-seven, both of a hectic habit, and delicate constitution, and both also died about eight years after the operation of a slow consumption.

It cannot be supposed that the accidental hæmorrhage could, in the slightest degree, have contributed to their death; yet it is probable that the hectic and debilitated state of the constitution at

the time of the operation, had so much weakened the structure of the bones as to render them more liable to such an accident, and that the muscular energy of the arterial system was more or less impaired by the general state of the health.

On examining the parts, however, that came away in the latter case, which are still in my possession, there was no appearance of disease whatever in the sockets.

CASE XXXVII.

I was consulted by Mr. R. of Philadelphia. His teeth were encrusted with tartar, but perfectly sound.

1814, Aug. 23. Scaling was proposed and immediately performed. In the course of the operation, however, a considerable deformity became evident. The left lateral under incisor was entirely out of the regular line of the teeth, and so much pressed towards the inside of the mouth, that the cuspidatus and left central incisor were in close contact with each other. The pronunciation was affected by this irregularity, and it had become very difficult, if not altogether impossible, to keep the neighbouring teeth clean; so that this part of the mouth in particular was covered with tartar.

In consequence of the accumulation of this matter, and of the strenuous efforts of nature to remove the irregularity and irritation of the tooth, much debility of the surrounding parts ensued, as was evident from the chronic inflammation of the gums, and from the devastation of the alveolar processes and the gums of the neighbouring teeth.

Having expressed my surprise that the tooth had not been removed, the gentleman replied, that in consequence of its effect on his pronunciation, and its interference with his performance on the flute of which he was passionately fond, he had long ago determined to have it removed; and in the course of his extensive travels he had applied to the most eminent dentists of Bordeaux, Paris, St. Petersburg, Hamburg, Berlin, and other places, every one of whom had discouraged his design, and refused to remove the tooth, under the plea of the danger that might result from the operation; and that at last he had begun to regard the evil as incurable.

It was, however, sufficiently evident that the difficulty frequently accompanying the extraction of very irregularly situated teeth, which was particularly apprehended in this case, was the only cause of their refusal.

My counsel, therefore, was very different, and I advised the immediate extraction of the tooth. I found no difficulty in refuting the objections that had been previously made, and soon satisfied the gentlemen of their fallacy. The tooth was removed, without

any immediate accident. A considerable hæmorrhage, however, took place the next day, and, after all the usual means were tried in vain, I was sent for.

Having succeeded so well in the last mentioned case of hæmorrhage, I determined to depend in this instance on mechanical means alone, notwithstanding the irregular and inconvenient situation of the cavity, which rendered it impossible to apply the pressure in the ordinary manner.

To overcome this difficulty, I prepared a plate of gold bent in the form of an inverted V, viz. Λ , sufficiently large to hang over the front teeth and cover the cavity from which the blood was discharged. This cavity was then filled with cotton dipped in warm water and vinegar; compresses of cotton were laid upon it, which, by means of the instrument placed over them and the teeth, were pressed down by the upper jaw. The bleeding instantly ceased; and the next day the patient was perfectly well. In two days the cotton came away, and the parts rapidly recovered.

It is scarcely necessary to observe, that it was quite impossible that the gentlemen who had refused to operate, could have anticipated any danger of hæmorrhage; indeed, it is most probable, that if the tooth had been taken out at an earlier period no hæmorrhage whatever would have occurred, since the muscular powers of the arterial fibres of the parts not being so much impaired at that time, an instantaneous contraction, accompanied with adhesive inflammation of the first intention, would have most probably followed.

Had I myself even foreseen the hæmorrhage it would have made no difference in either my advice or operation, inasmuch as I consider it in no degree dangerous, if timely and judiciously treated.

CASE XXXVIII.

Miss R. a young lady of Virginia, was at one of the most respectable boarding schools in Philadelphia, of about fifteen years of age, and of a full and inflammatory habit; her gums were scorbutic, and many of her teeth in a state of decay. It was determined to extract the four first large grinders, and to restore to perfect health every other tooth.

1815, May 15th. About eleven o'clock, A. M. the upper two grinders were removed. In the evening, about seven o'clock, I was sent for, on account of hæmorrhage from one of the sockets.

Considering, however, that the bleeding would be beneficial to her general health, I interfered only so far as to request the patient to keep herself quiet in bed; to wash her mouth frequently with water as warm as she could pleasantly bear; and to let the bleeding go on until night. I remained with the family till about eleven o'clock in the evening, when I filled the cavity with cotton dipped in warm water and covered it with compresses, keeping

the mouth shut by a bandage. The bleeding immediately stopped, and the patient was able to attend to her studies on the following morning. Dancing alone was prohibited for a few days.

Four days afterwards she came to my house to submit to the next operation; when I extracted the two under first large grinders without any unpleasant consequences; the other necessary operations followed until her mouth was restored to perfect health.

The bleeding, as well as the proper treatment of her teeth, appeared to have had a striking beneficial effect upon her general constitution. Her health became robust; her complexion had changed from that of a dingy erysipelatous appearance of the entire skin, to a beautiful red and white. Her general health, and that of her teeth, were perfectly good, when I heard from her last, which was many years after the treatment.

CHAPTER VI.

OF THE OPERATION OF STOPPING CARIOUS TEETH.

Practical remarks on the operation.

THIS operation is of great antiquity. It was known amongst the ancient Romans; and even Galen and Cælius, amongst the Greeks, treat of it in their writings.

Stopping or plugging teeth is the filling up of cavities, produced either by caries, or by an instrumental removal of the carious matter, with some artificial substance.

By this beautiful and useful operation, teeth which are greatly injured by caries, may be preserved for many years; in most instances, during the remainder of life; and not unfrequently, from ten to twenty teeth may be preserved by this operation, in the same individual. See cases 7, 15, 16, 17, 18, 19, 42, and 44.

The preservation of all useful teeth, capable of preservation, should ever be considered a matter of the greatest importance to the general health, as well as to the health and beauty of the teeth. Whenever, therefore, requested to perform the operation of extraction, the dentist should first satisfy himself of the absolute necessity of such a procedure, as it would be at all times his duty to obviate that painful necessity if possible, and, when unavoidable, it should be a powerful inducement for preventing its future repetition, by applying the various remedies of dental surgery at an early period.

No operation, I believe, is more frequently indicated, and none better calculated to answer this purpose, than that of stopping ca-

rious cavities with metal; and, if performed with proper judgment and skill, none can afford greater satisfaction, both to the patient and the operator.

Although it may appear vain, yet I consider it necessary to state, that there are thousands of individuals who have been benefitted by this operation by my own hands, in different parts of America and Europe; and, considering the great distress which has been thus obviated, and the comfort afforded to so many persons, a great number of whom do highly appreciate the great advantages afforded by it, I cannot refrain from indulging the most sincere feelings of gratification and happiness.

Impressed with these sentiments, I have always deemed it the important duty of the dental surgeon to make himself master of the most beneficial means for restoring to perfect health, and preserving in the best possible manner all such teeth, of which the preservation is in any way practicable, without allowing any interruption from such difficulties as may arise from the situation of the tooth, or the nature of the disease; and, with such principles only, I am convinced that the dentist of skill and integrity, may become a useful member of society, in alleviating human distress; and cannot fail, not only to effect a perfect restoration of local health to almost every mouth placed under his care, but also thereby obtain a great share of the healing art, in preserving and prolonging health and life.

I hope I may be permitted to add, that I have myself scrupulously adhered to these principles for many years. In illustration of their general correctness, I beg to refer the reader to the various cases related in this treatise; in which it will be seen, that perfect health has often been restored to individuals who were suffering from the most extensive and complicated diseases of the mouth; some of which required the most extensive dental treatment, even amounting to sixty-two successive operations, before perfect health and beauty could be restored to the teeth and mouth. See cases 7, 16, 18, and 19.

It is, however, a matter of importance both to the dentist and to the patient, that the great difficulties accompanying this operation, when properly performed, should be known; for, only when performed consistently with just principles, and with great skill, is the operation of stopping teeth to be regarded as one of the most useful in dental surgery, and productive of the greatest and most permanent benefit to the patient; but in the manner in which it usually is performed, and in the few instances in which it is considered practicable and well adapted, it certainly is not very difficult: nor, on the other hand, of any utility, but even the operation itself becomes the means of increasing the disease, and of hastening the destruction of the teeth. I am myself deprived of

ten valuable teeth in consequence of the difficulties and abuses so frequently accompanying this operation. See Case 8, and as another striking proof of this fact, I beg to relate the following instance.

CASE XXXIX.

Miss H. a young lady of great respectability, of London, visited America, and was placed in one of the first boarding schools of Philadelphia. In 1811, I attended to her teeth, but her immediate return to England admitted of only a partial treatment, and but few of her teeth were stopped with gold.

1824, December 13. After my arrival in London, this lady, who was then married, and mother of several children, consulted me again, and bitterly complained of the unsuccessful dental treatment she had received at the hands of some of those, so ridiculously called fashionable dentists of London, stating that she had repeatedly submitted to many and various operations, such as, scaling, filing, cutting, stopping, and extracting teeth, but without any benefit: and she had especially observed the fact, that every tooth, which had been stopped since her departure from Philadelphia, had either been lost or totally destroyed some years after the operation; whilst those which I had stopped fourteen years previously were yet perfectly sound and useful.

By a particular examination, I found her teeth and gums in a state of general disorder, and injured much more by improper treatment than by their natural diseases, but, notwithstanding this, I had the great satisfaction to find those teeth, which I had stopped in Philadelphia, not only perfectly sound, but precisely in the same state in which they were immediately after the operation.

By the removal of such teeth as had become too much injured by disease and improper operations, and by a judicious treatment of the diseases of the remaining teeth and the gums, the mouth of this lady was again rendered perfectly sound, and her constitution, which had considerably suffered from the local diseases, was restored to its previous health and vigour.

Of the present Imperfect state of the operation of Stopping Carious Teeth.

Although the stopping of teeth is one of the most common operations at the present time; yet so little is it understood, and consequently so imperfectly is it performed, that great injury rather than benefit is its most frequent consequence.

During my residence in the United States of America, I had ample opportunities of judging of the state of dental surgery, not only in that country, but also in others, by being frequently consulted by distinguished foreigners from almost all parts of the world; and I have been thereby enabled to observe its progress

towards perfection in every country. In almost every instance where this operation had been performed, that came under my inspection, it had been productive of no benefit, but generally proved destructive of the health of the teeth.

The slight scientific attention that has been paid to this subject is particularly proved by the superficial manner in which English, as well as foreign writers, have treated of it in their works. A detail of a few statements of those authors will sufficiently convince the judicious reader of the truth of this assertion; but, in order to afford a proper idea of the present state of this operation, both as to its theory and practice, it is necessary not only to notice the methods recommended by some of the most eminent writers on dental surgery, but also those generally adopted at present by the profession.

With regard to the former, it will be sufficient to take notice of M. La Forge and Mr. Fox. The manner in which these gentlemen treat the subject fully proves that they were unacquainted with its great advantages, and that they were not capable of overcoming its difficulties. Their sentiments differ in no material point either practical or theoretical. A view of the opinions of Mr. Fox, therefore, may suffice to represent those of both.

The instruments recommended by Fox are nearly the same as those described by M. La Forge in the *Theor. et Prat. de l'art du dentiste*, vol. ii. plate 4.

Considering it impossible, under certain circumstances, to stop the cavity of the tooth, with metal, Mr. Fox gives no directions for the treatment, and M. La Forge recommends the introduction of a gum mastic, which could not fail to enhance and to extend the diseased action already existing.

Mr. Fox, in treating of caries, expresses his opinion in the following manner with regard to the operation of stopping or plugging, "Beneficial as this practice really is, there are some cases in which it cannot be adopted; such are an unfavourable situation of the decay, or its being so superficial as not to afford depth sufficient to retain the gold leaf. When the decay is situated on that side of the tooth which is in opposition to another, so that persons say, the decay is between two teeth, it is always difficult, and frequently impossible, to retain the stopping." See his *Nat. Hist. of the Teeth*, &c. part ii. p. 35.

In speaking of the operation itself he again states the impracticability of its performance in certain cases, as already noticed. See his *Nat. His. &c.* part ii. p. 146. Though I allow it to be sometimes difficult, it is nevertheless by no means impracticable to a skilful and determined operator.

This author also strongly recommends a new invention of stopping teeth in certain places with metal in a state of fusion; a

treatment, certainly much worse than gum mastic, and, as will be evidently seen, quite incompatible with the intention of this remedy, the preservation of the health of the teeth, as will be more particularly stated.

Of the usual Instruments for Stopping Teeth.

The instruments recommended by Mr. Fox and M. La Forge, are such as are usually found in sets, or cases of scaling and stopping instruments, and consist of:—

1. A hook for extracting foreign substances from the cavity.
2. A straight stopper. 3. A curved stopper, for pressing the material into the cavity. 4. A burnisher, to polish the surface of the plug.

An apparatus so limited, is, indeed, in my opinion, insufficient even for cases the most easy and convenient for the application of this operation; and much more so for difficult cases, even though the operator should have a great variety of each kind of these instruments.

When the decay is situated on the grinding or external surface of the tooth, it may sometimes be possible to stop the cavity with metal, by means of these instruments; and it is owing to the facility of performing this operation on those places, that it is oftener performed there, than on any other part.

A careful and judicious preparation of the cavity for the reception of the plug, is the most important and most difficult part of the operation; this is generally either imperfectly performed, or left wholly unattended to.

The success of this operation is impossible, if from any cause, whether neglect in the operator, or from imperfection of the instruments, the cavity be not perfectly cleansed and freed from all foreign and dead matter, and also from every diseased and inflamed part of the bony structure: inasmuch as the least portion of the latter, being left in the tooth, will spread its destructive ravages more rapidly than before.

The effect of such negligent treatment is, invariably, a chronic inflammation of the whole bony structure, which will, sooner or later, extend itself to the lining membrane, and destroy the tooth, though generally without pain, and in much less time than the disease itself.

The second part of the operation, viz. the proper introduction of the metal into the cavity; and upon this principally depend the permanency of the cure, and the ultimate preservation of the tooth, is also, in many cases, very difficult and tedious.

It will frequently happen that the cavity is imperfectly filled, in consequence of want of power in the present instruments to press in the metal sufficiently, and it consequently becomes a means of

injury, by affording a reservoir for the saliva and other foreign matter; which, mixing with the metal, produces new inflammation and caries in the bony structure, and, ultimately, complete destruction of the tooth in a much shorter period than the disease itself, if left alone and undisturbed, would have destroyed it.

When the cavity is situated in such a manner as to require much lateral pressure against the tooth, great caution is requisite, to avoid doing injury by loosening it or by producing inflammation in the periosteum.

I have frequently seen so much suppuration ensue from an injudicious application of pressure, as had the effect of destroying the alveolus and life of the tooth in a short time, and also greatly affect the neighbouring teeth and other parts of the mouth, while the tooth itself was rendered so loose as to become very troublesome, and at last to require extraction.

Great injury may be frequently caused by such unsuccessful operations, even without the knowledge of the patient, until the tooth is wholly destroyed, and the neighbouring parts much affected.

This artificial process of destruction generally takes place very gradually, and without any acute pain, and is, for that reason, very dangerous, as it prevents the patient from applying for advice, and from attending to his teeth himself.

Sometimes, however, very troublesome and painful symptoms, are early consequences of an improper or injudicious performance of this operation, which make the patient conscious of his situation; such as gum-boils, carious abscesses, &c.

Although the causes of the mischievous effects may not be discovered by the patient till a late period, they are always evident to the eye of the experienced dentist.

If the tooth is stopped with gold in a proper manner, it will appear bright and clear, like a perfectly sound tooth. But if the cavity is not thoroughly cleansed before the operation of stopping, the tooth will first assume an opaque appearance, like that of a dead one; and, if the stopping be not well secured, the caries, excited by the operation, will occasion a dark appearance, and the plug will be pushed out, and thus the disease itself will remove the artificial cause.

Should the caries have been deep, and the gold well forced into the cavity, the disease, not having sufficient power to remove the artificial cause of irritation, will directly proceed towards the nerve, and destroy the life of the tooth, which then becomes a foreign body, and liable to the influence of putrefaction only, by which, although it is very slowly wasted away, its morbid influence extends to all the neighbouring teeth, and other parts of the mouth.

Where, however, every particle of caries and foreign matter has been removed, if the gold has not been well pressed into the cavity, a blue circle generally will first appear round the stopping, and will gradually approach nearer the centre, until the plug has lost its bright golden appearance, and acquired a coppery hue, and at the same time the caries, reproduced by the extraneous matter which is mixed with that of the plug, generally eats its way into the lining membrane, and destroys the tooth.

All diseases of the neighbouring parts, the gums, periosteum, alveoli, or maxillary bones, which arise from an injudicious or unskilful performance of this operation, may be immediately detected by the symptoms which I have enumerated here, and in other places.

Of improper Materials used for Stopping Teeth.

Various materials and metals have been proposed for the stopping of the teeth, all of which are more or less objectionable.

Lead, tin, and silver, are frequently employed for this purpose, but they are all destitute of the properties indispensable to success in the performance of the operation. Any of these metals will protect the cavity from caries for a short period only. They will all soon corrode, and then become more injurious than the original disease; and, in every case, will ultimately prove the cause of destruction to the tooth, which might have been preserved by proper treatment.

Although platina is a more suitable metal than any one of those above-mentioned, yet, in consequence of the necessity of amalgamating some other metal with it to render it malleable, it is by this adulteration rendered insufficient for the purpose. It is never accompanied by that cleanly and bright appearance, so desirable for teeth that have been stopped to present; but is productive of a dingy opacity of the tooth's surface, which is apt to mislead the dentist at a future period into an idea of its being again under the influence of caries, and is, therefore, also objectionable.

Even gold, the only proper substance for this operation, as it is often prepared for the dentist, though free from copper, is, not unfrequently, alloyed with silver, which renders it harder and in some measure liable to corrode, and is, therefore, in this state to be rejected.

M. La Forge in his *Theor. et Prat. de l'art du dent.* v. i. p. 194, advocates the use of gum mastic in some instances, for stopping teeth, which is unquestionably one of the most improper materials for this operation.

The mastic, being kept constantly wet with the saliva, can never become solid in the cavity, but in a few days it will corrode and render the tooth tender and soft, and, at last, produce decay.

At the same time it acts very perniciously on the saliva, so as to occasion very bad breath, and greatly to injure the other teeth as well as the general health.

In cases where a more judicious professional assistance than the above cannot be obtained, it would be better for the patient to keep the cavity as clean as possible and free from every foreign matter, than to fill it up with any material of the above kind whatever; even though the lining membrane should be actually exposed: for it will bear the action of the atmospheric air and saliva with less injury than the irritation of the mastic, or any other substance of a corrosive nature.

The mistaken idea that the atmospheric air or the saliva is very hurtful to the dental nerve has led to the adoption of many false notions and practices; as it has, for instance, to the above method of stopping teeth. Of all foreign irritating causes, these are the least destructive; the former is injurious only in an extreme state of the temperature, and the latter when in a diseased state from general disorder, or mixed with some other matter: hence, by the above operation, a much more destructive substance is placed into the cavity of the tooth to keep out much less injurious influences.

In one instance I have seen the nerve of a large grinder quite free from inflammation, though from the appearance of the tooth it had been quite exposed for a year. The health and vitality of the membrane had been preserved by the naturally cleansing power of the saliva which had removed all morbid irritating causes. I have extracted and preserved this tooth as an illustration of the great irritation the nerve may bear, if the tooth is preserved healthy and free from carious matter.

Mr. Fox, however recommends a more pernicious material for plugging teeth than any yet mentioned.

He proceeds thus: "A new method of stopping the teeth has been recommended to me by some chemical gentlemen, which promises to be very successful in all cases where the tooth is not tender and the caries is situated in the centre. The composition for this purpose is made of bismuth, eight parts; lead, five parts; and tin, three parts: a heat of the temperature of boiling water is sufficient to melt it; hence it is called the fusible metal. The cavity of the tooth being wiped quite dry, may be stopped by pouring a drop of this metal into it, when it instantly becomes solid; and in cooling, as it strikes into all the irregularities of the carious part, it is a perfect mode of filling it up." See his Nat. Hist. part ii. p. 148.

It is really surprising that a dentist, so well acquainted with the structure of the teeth as Mr. Fox was, should have recommended this injudicious practice; indeed, that any practitioner of ordinary judgment should adopt such a treatment, as, in my opinion it is

evidently in opposition to all sound surgical knowledge, and incompatible with the object of such operation.

The destructive effects of this process are so evident, and consequently the impossibility of any beneficial result so certain, that I should consider it unnecessary to enumerate its pernicious consequences; were it not that the operation is frequently performed in this country on the authority of Fox; and that it is the common practice of other countries, particularly of France.

In the first place, this metallic compound is as liable to corrode as either lead or tin, and possesses all the other noxious chemical qualities of both.

Secondly, it is in accordance with Mr. Fox's own theory, as it must be with that of all just physiologists, that the bony structure of the teeth is of a vascular nature; hence, after the diseased part of a tooth has been cut out of the carious cavity, the new and healthy surface thereby exposed, must be particularly susceptible of external irritation at such a time. The metal, therefore, introduced into this cavity at the temperature of boiling water will not only destroy the vitality of the living fibres, but also the whole surface of the healthy bone, and thereby reproduce some dead bony substance and caries, the very disease intended to be cured by it, which will inevitably destroy the tooth.

Thirdly, the cavity is not very distant from the lining membrane of the tooth, an inflammation will be immediately produced in that membrane by the irritation of the hot metal and the vitality of the tooth must naturally be soon destroyed. Should, however, the nerve recover from the violent irritation, and the tooth appear to go on well, it will be but of short duration, as it will certainly be destroyed in the manner above stated.

This, however, is not all, there is a fourth objection to it, of itself sufficient to prove the impropriety of this operation. The metal being poured into the cavity in its liquid and expanded state will contract as it cools, and consequently, instead of being "a perfect mode of filling it up," as Mr. Fox asserts, it will leave interstices for the reception of foreign matter, which will destroy the tooth more quickly than if the cavity had not been stopped at all.

This unnatural operation was introduced in 1820, at Philadelphia, by a young dentist who had recently arrived there from London. I was consulted in some of his cases not long after the operations had been performed; and I shall here take the liberty of relating one of them.

CASE XL.

A young lady, about twelve years of age, had the first large grinder of the right side of the under jaw stopped by that gentleman in the above manner, some time before I saw her.

She had patiently suffered, at different times, the most excruciating pain for several successive days in the hope of ultimate benefit; but at length it became quite insupportable, and very alarming to her anxious parents. The great agony she endured had repeatedly occasioned fits of convulsions, and many other nervous and rheumatic symptoms, and produced a great change in her personal appearance and constitutional health.

Not long before I was consulted she had experienced a renewal of excessive pain, accompanied with so violent a fit of convulsions as to resemble epilepsy; in consequence of which, the father called on me, with tears of anxiety flowing down his cheeks, and when I arrived at his residence, I found the family in a state of the most poignant grief.

All the pain and anxiety of the patient and her parents were immediately relieved, by the removal of the affected tooth: the nerve which was found to be in a state of active inflammation and suppuration. The tooth was large and beautiful, and might have been preserved during life, and all the painful and alarming symptoms and derangements which were occasioned by the operation, might have been prevented by an early judicious treatment.

Of certain injurious methods of Stopping Teeth.

I recollect some practices of the profession which cannot be too strongly deprecated; and, amongst others, that of using a common drill, turned by a bow and string, for making the cavity in the tooth sufficiently large, and otherwise adapted for the reception and retention of the plug. Without considering the almost entire impossibility of giving that direction to the drill, which the caries has taken, with any degree of certainty, and the frequent consequent destruction of important parts of the bony structure, as well as of the lining membrane; the excessive irritation and pain, produced by the rapid friction of such instrument, is alone sufficient to destroy the vitality of the bony structure of the tooth.

But what is more surprising and repugnant, after the tooth is thus prepared for the reception of the stopping, some operators actually employ a hammer and punch to drive the metal into the cavity of the tooth.

I have seen the most alarming consequences proceed from this barbarous practice, particularly in the case of several ladies who consulted me in Philadelphia. Many of their teeth, especially the incisors, or front teeth and cuspidati, had been plugged in this manner. Some of them had already lost their vitality, and were discoloured when I saw them, and others were so tender, from the violence that had been used, that the least pressure upon them caused exquisite pain. Considerable inflammation in the periosteum and alveoli was apparent also, and was fast extending round

the gums, which were much swelled; and in some parts suppuration was actively at work to effect the removal of the dead tooth.

There is another practice not less improper and absurd than that just mentioned, which, however, is very common, but especially among French dentists. After the removal of the dead matter from the carious cavity, whether perfectly or imperfectly effected, the actual cautery is used, probably with a view to remove the tenderness, produced by improper and violent means employed for the extirpation of caries, or the consequence of symptomatic inflammation in the general bony structure of the tooth.

The effect of such injudicious treatment, is either the reproduction of the very same disease for which the operation of stopping the tooth is instituted, viz. caries, which is thus artificially created by the destruction of the vitality of the bony surface of the cavity, by which the whole tooth is gradually decaying; or an immediate inflammation in the lining membrane in consequence of such violent irritation, by which this membrane and the whole tooth are rapidly destroyed.

When the caries are situated on the inner side of the teeth, or on that side where they approach each other, the operation is, undoubtedly, very difficult; and, according to the opinion of Messrs. Fox and La Forge, though very erroneous, altogether impracticable: for this reason the operation is seldom attempted, although frequently requisite; in those few cases, however, where teeth have been stopped under such difficult circumstances, the operation has been almost invariably so unskillfully performed as to aggravate rather than to remove the disease, and sometimes even to excite a new and not less destructive malady.

In all such instances of malpractice it is a fortunate circumstance for the reputation of the unskilful operator, that to form a just idea of the causes of the disease, requires a very scientific knowledge of the parts, and that the effects of such treatment are generally not apparent to the patient until some time after the operation is performed. It is, however, equally unfortunate that the patient is frequently deceived during life, and that the ignorant operator, instead of being justly exposed to severe reproach, gains credit and applause for doing much more injury to his patient than the disease could possibly occasion without his improper interference.

Of the author's method of Stopping or Plugging Teeth.

Having attempted, in the foregoing pages, to give a fair view of the importance as well as of the present imperfect state of this operation in dental surgery, so useful when judiciously applied and skilfully performed, and so pernicious when performed, in the

usually imperfect manner; I beg to state, that so far from agreeing with any previous author on this subject, and from considering the operation of stopping teeth as impracticable in any instance in which it is indicated, I deem it the imperious duty of the dentist to be so prepared for its proper performance, not only as it regards his scientific knowledge and surgical skill, but also with all the necessary mechanical means and materials, as never to be obliged to omit its recommendation and performance on the ground of any inconvenience or difficulty whatever.

In accordance with such principles, it will be necessary for me first, to point out, as far as possible, the means and materials properly adapted for stopping teeth, and next, to establish the circumstances which indicate the operation, and the principles and method for its proper performance.

Of the best Mechanical Implements for Stopping Teeth.

A skilful performance of this difficult operation depends in a great measure upon the extent and suitableness of the operator's instruments. The great variety of circumstances, under which the stopping of teeth is performed, renders a complete and appropriate set of instruments indispensably necessary to insure its full success.

When I began my practice, I was provided with those instruments only which are generally recommended, but I soon became aware of their imperfection, and I forthwith began and have since continued to improve and to extend them, in proportion as my experience and judgment became more mature.

The instruments which I have used for many years, and which have enabled me to encounter and overcome difficulties, apparently insurmountable, have been continually varied and improved as circumstances arose in the course of my experience to render such alterations and improvements necessary; and without these exertions I should not have been enabled to perform this operation in every necessary instance.

I have so much altered the implements of this part of the art, from those generally used and known, that I am well aware of the impossibility to give a verbal description of my present apparatus, sufficiently distinct to be of any extensive use to the profession; and inasmuch as they are intended to meet various difficulties, they greatly differ from each other in form, and are so numerous, that a proper description of them would occupy so much space, and require so many engravings, as would render this work too voluminous and expensive.

On looking over my cases of instruments, while preparing this chapter, I find for this operation alone more than one hundred and seventy separate implements ready for use; not to add, that I am

always provided with some particular mechanical tools, with which I can, at any time, modify certain instruments, with a view to adapt them for uncommon cases with very little delay.

Of the Material best calculated for Stopping Teeth.

From what has been already stated, it is sufficiently clear that of all the materials generally used for this operation, no other is properly adapted for it than gold, perfectly free from alloy, and otherwise well prepared for the purpose.

To insure the possession of such a material, I have, for a considerable time, taken great care to submit the gold intended for my use to a chemical process under my own inspection, by which the smallest portion of any alloy, either of copper or of silver, is extracted before its preparation is completed.

The gold for stopping teeth is prepared in the form of leaves, much like those used by the gilder in appearance. They should, however, be always considerably thicker; and the dentist should be provided with leaves of various degrees of thickness, in order to choose and adopt the stopping according to different circumstances. I generally keep about six different degrees of thickness of the gold leaves in my possession. This metal thus prepared is the most suitable material for this operation; it is the softest and most malleable metal; it will never corrode, and it produces the most beautiful effect upon the appearance of the tooth stopped with it, so much so, indeed, that a front tooth, which is properly plugged in such a manner that the gold is not seen, is actually improved, not less in appearance than in health.

In fact, gold is the only material, the durability of which can be depended upon, and which combines all the advantages required for the due performance and success of this difficult and important operation. If, for instance, carious teeth are plugged with pure gold, the experienced eye of a judicious dentist can ascertain, at the first glance, whether the operation shall have been performed conformably to the fundamental principles of the art; whether a cure of the caries has been effected, and whether the tooth may not be still suffering from the least remains or relapse of the disease.

In Philadelphia I have frequently been able to distinguish my own operations from those of every other operator, and sometimes even to state the name of each dentist who had performed any operation of the kind on the same subject, whose teeth had been, at separate periods, under the management of two or three different dentists, whose modes of practice were known to me.

Since the second year of my practice I have used no other metal than the purest gold for this operation; of which the great expense, although a heavy tax on the dentist, should never be a

matter of consideration, if it cannot be denied that it is the only proper material for plugging teeth. And it may be hoped that the time has gone by, when these operations so conducive to health and cleanliness should be influenced by an ill judged parsimony.

Certainly it might be expected, that even those who move in the most humble circles of civilized life, would prefer expending this precious metal to remedy what is equally pernicious to themselves and disgusting to others, rather than load themselves with costly jewels and trinkets which can only exhibit their economy in a more unfortunate and injudicious point of view.

The celebrated Roman matron, proudly boasted that her children were her only jewels; and youth and beauty may, indeed, in the same manner, be most proud of a sound set of teeth, which at once communicate the idea of health and cleanliness far superior to the choicest pearls and most costly trinkets.

Of the indications for the operation of Stopping Teeth.

The great variety and indistinctness of the symptoms of caries render it rather difficult to give an exact description of them; and although this operation is as frequently indicated as any in dental surgery, yet it is far from being a sovereign remedy for every decayed tooth, as it seems to be considered by many injudicious practitioners, as well as by a great portion of the public.

Nothing can be more inconsistent with sound judgment, than the attempt of stopping stumps and roots of teeth, and such teeth as are in a state of putrefaction, or labouring under primary inflammation or suppuration in the lining membrane.

In every instance where the disease has completed its work of destruction, or has advanced to such extent as to be incurable by the combined efforts of art and nature, the tooth is no longer capable of preservation, and it must therefore be extracted.

We know, on the other hand, that caries in the teeth is a malady which cannot be arrested or cured by nature alone; but must always end in the destruction of the tooth affected, if art does not interfere to effect a principal part of the cure.

All carious teeth, therefore, in which the disease has not advanced to that extent, and present no other indication which urges their removal, possess the greatest claim upon the dental surgeon, for their cure and permanent preservation.

The operation of stopping such teeth, is one of the principal curative means in the hands of the dental surgeon. There are, however, other remedies, also, of equal efficacy if judiciously applied. Such are, filing, and cutting, or the complete removal of the diseased parts of the bony structure by the file, or other suitable cutting instruments, so as to produce a regular and plain sound surface of the tooth by which its health is preserved.

In many instances, there is no small difficulty to decide which treatment is most indicated, and most preferable for the cure of the disease; and, as it is not in my power to treat particularly of the operation of filing or cutting away the caries, at present, it may not be amiss to make a few remarks here on these remedies, so far, at least, as it may facilitate the decision upon the adoption of either of these operations.

In treating on caries, I have already stated as the best general rule for the treatment of that disease in its simple state, to extirpate all the carious parts and to stop the cavities produced by deep-seated caries, and also such as are produced by superficial caries, when the disease has penetrated more than one-third of that side of the bony structure of the tooth.

If, however, the external caries should extend over a large and broad surface of the tooth, without having entered very deeply into the bony structure, or if the cavity occupies only about one-third of the affected side of the tooth, it should be removed with the file or cutter. This last rule, however, is subject to many exceptions, and the indication of these exceptions can only be ascertained by experience, and by a minute consideration of all the circumstances making for or against either treatment, viz. the nature of the constitution, and the greater or less predisposition to that disease in the teeth; the situation of the disease in the tooth; the various forms of the teeth; the form of the individual tooth affected; and the particular appearance of the decayed part.

It is owing to the frequent absence of the necessary judgment for the operation of filing, and to the great difficulties incident to this remedy, that it proves so frequently unsuccessful and destructive in its effects: and hence the unjust and injurious prejudice so extensively prevailing against the filing of teeth.

When the front teeth of an individual of delicate health, for instance, are filed instead of their cavities being stopped, when the latter operation is properly indicated, the surface of the bone, thus exposed, is rendered the more tender the nearer it approaches the nerve of the tooth; and, moreover, if the local causes of the different diseases of the mouth have not been previously completely eradicated, as they generally are not, these teeth will decay again, and the sooner on account of the operation; and the substance which might have received and retained a plug being thus removed, that operation is rendered impracticable, and the teeth are irretrievably lost.

Or, if appearances mislead an incompetent operator into a notion that the disease is superficial when it is actually very deep, and approaching towards the lining membrane, and he should determine to use the file, the tooth is inevitably ruined by such a pro-

cedure: because, if all the caries be removed, the nerve of the tooth will not be sufficiently protected, and it will even sometimes be exposed; and if it be not completely removed, the disease will remain: and being aggravated by the filing, it will become more active than ever in its destructive progress. In such a case, no beneficial results can possibly arise from the operation of filing, while, on the contrary, the irritation and exposure are sure to cause an inflammation of the lining membrane, and consequent destruction of the tooth.

But these injurious consequences, which are very unjustly attributed to a remedy of great efficacy and value when properly used, should be charged to the want of skill and judgment of the operator and its misapplication.

To guard against these mistakes and to prevent these ill consequences of the operation of filing and cutting away the caries, when injudiciously adopted, if any doubt should arise in the mind of the operator on the extent of the decay, he should pursue such treatment as, if he should be mistaken, will leave him an opportunity of adopting either of the operations: that is, he should first extirpate all the decayed and diseased parts of the bone, and then decide whether it might be best to file away the whole surface to the same depth, or to fill the cavity with gold.

This temporizing practice will, however, take twice the time, and produce much more irritation than a decided manner of operating: but it is the safest way for him who is in doubt.

These operations, however, do not cure any primary affection of the lining membrane, nor the actual tooth-ache, as is frequently supposed by such as are unacquainted with the subject; on the contrary, the filing or cutting, as well as the stopping, under such circumstances, instead of affording any relief or protection to the affected parts, would, by its pressure or irritation augment the disease, and consequently the painful symptoms; and it would also destroy the vitality of the membrane, and thus become the direct cause of the loss of the tooth.

Either of these operations are certain remedies only when properly employed, and when the caries has not penetrated through the whole bony structure of the tooth, and has consequently left a sufficient portion of the bone in a sound state, for the protection of the nerve.

It is not, however to be supposed that the preservation of all such teeth is impossible of which the nerve is affected, or in which the caries has arrived at its complicated state.

If the disease has advanced to this form, although no other remedy than that of stopping the carious cavity can permanently preserve the vitality of the tooth, yet this operation is calculated for the cure of this state of caries as a second part of the remedy

only. The lining membrane of the tooth requires the first attention of the dentist, and on the proper treatment of this part depends the immediate preservation of the health and vitality of both the soft and hard structures of the tooth; whilst the stopping in reality forms but an artificial substitute for that part of the bony structure which has been destroyed by the disease, and a future protection of the lining membrane.

To this treatment of the lining membrane of the teeth when exposed or affected, I shall devote the following chapter; in which it will be seen that, by a proper previous treatment of this delicate structure, it is capable in many instances of being restored to health and preserved; this cure, however, in such cases, is effected by the previous treatment, and not by the stopping of the cavity.

Of the principles of the operation of Stopping Teeth with gold.

The great sympathy existing between the teeth, their relative parts, and the system generally, must be evident to every scientific and experienced dentist. It is, however, more especially indicated in the appearance of the teeth during the presence of general fever; and on such occasions it may be frequently made known to the patient, by a peculiar sensation of tenderness or soreness in the teeth and periosteum.

The feelings of the individual, however, are not always a certain criterion. Chronic inflammation of the bony structure of the teeth, and the other parts, are not always accompanied by this sensation in the mouth. The teeth may sometimes perform all their usual functions without creating any remarkable inconvenience, and yet without being in a state to bear this operation, which might not only produce considerable pain at the time, but prove unsuccessful and injurious, from the great probability there might be of its producing inflammation in the lining membrane and the periosteum, and of its thus destroying the vitality of the tooth.

To render the operation of stopping carious teeth certain in its success, it is necessary, therefore, that the tooth to be stopped should be previously perfectly freed from all symptomatic inflammation of either the lining membrane or bony structure.

General fever, even of the slightest kind, such as accompanies a cold or cough, should be considered as a sufficient cause for delaying the operation; and it should never be attempted except when the individual enjoys his usual good health.

To remove every local exciting cause of inflammation, especially every disease of the mouth that might be considered the principal exciting cause of the local maladies of the teeth, should be deemed as the next essential and indispensable duty devolving

upon the dentist, before he could properly undertake the operation of plugging the affected tooth.

When the parts in immediate connexion with the teeth, such as the gums, the alveoli, the periosteum, and maxillary bones, and even those more distant, are in any way morbidly affected, they should therefore be previously restored to their healthy action.

For more than thirteen years have I made it an invariable rule in my own practice, not to stop teeth until I have completely cured all the diseases of the gums, the periosteum, alveoli, and maxillary bones; by using this precaution, I have seldom failed to be completely successful in the application of this remedy.

By scrupulous attention to these fundamental principles of previous treatment, the operation is attended with very little pain, notwithstanding the great pressure which is sometimes required to be applied, both for cutting away the caries, and for plugging or filling up the cavity in a durable manner. In fact, this remedy should never be attended with great pain, as that would be a proof that the operation was untimely, or that some part of the process of it was improperly performed.

Of the manner in which the operation of Stopping the Teeth should be performed.

The operation of stopping teeth may be divided into two parts, viz. the curative, and the preventive parts of the treatment.

The first consists in the perfect and judicious extirpation of the bony abscess, the caries, by which only the disease can be radically cured: and the second is the proper stopping of the cavity, on which the permanency of the cure altogether depends, and by which the relapse of the disease is prevented.

By the extirpation of the dead and diseased parts, the tooth is rendered sound but remains defective: and, as the cavity is incapable of being filled up by any regenerative process of nature, it becomes a reservoir for the accumulation of corrosive matter, whilst the nerve is left insufficiently protected after the extirpation of the caries, and having lost a portion of its strength, it is placed in a state to require further treatment, to prevent a relapse of the disease.

This treatment, the filling up of the cavity, by an artificial substitute in order to remedy the defect, is the second part of the operation, by which the following three great objects are attained, viz. security against any accumulation of corrosive matter in the hollow of the tooth; the protection of its lining membrane; and the restoration, in a great measure, of the former health and strength of its bony structure.

In performing the first part of the operation, great care should be taken to cut away all the affected bony structure; that is, not

only such as is brown, or has a darker appearance than the rest, but also every other part that is not white, and possessed of vitality and perfect health.

The disease sometimes extends itself in different directions from the centre. All such parts must be entirely removed; for if any portion affected with caries, though it might be no larger than a grain of sand, be left in the cavity, a permanent cure cannot be accomplished, as the disease will remain, and ultimately destroy the life of the nerve.

In the different stages of complicated caries, the lining membrane is covered only by such dead part of the bony structure as is always destructive to this membrane, and is either hard and not corroded, or soft and in a putrid state: sometimes even the nerve itself is partially exposed. In such cases inflammation of the lining membrane will unavoidably ensue; and a cure of the disease is impossible, unless the carious matter is entirely removed.

At such an advanced stage of the disease, the nerve must be laid bare, and treated so as to remove any slight irritation and to arrest the bleeding if it should be wounded; and to prevent such future irritation as might produce inflammation. The particulars of this treatment will be stated in the next chapter.

The final consideration in the management of this part of the operation is, to take great care to give the cavity a proper form in order to retain the metal. For this purpose it should be round or oval, entirely smooth, and free from ragged edges; and, before the metal is placed in the tooth, the cavity should be carefully washed out with locks of cotton dipped in warm water, and afterwards completely dried in the same manner, by repeated use of dry locks of the same substance.

In performing the second part of the operation, the stopping of the tooth, the metal should be firmly pressed into the cavity, and rendered as compact as if it were solid metal, so that nothing could by possibility penetrate through it. The operation is then to be completed in the following manner. The redundant metal is to be cut away, and the plug perfectly smoothed and polished by some burnishing instrument.

If every necessary attention is paid to all the above indications, it may be confidently expected, that, in most instances, the lining membrane will be preserved from exposure for half a century and upwards.

In those cases in which the teeth are to be stopped on their grinding surfaces, or on their internal or external sides, the operation is to be performed in the way already mentioned; but when the caries is situated on that side which is next to the adjoining tooth, a division must be previously made with a file between these teeth, in an oblique direction towards the neck of the tooth,

so as to admit the instruments necessary for the extirpation of the caries, and the filling of the cavity.

Although all teeth are more or less subject to become diseased in these places, the incisors and cuspidati most frequently require this treatment. In these teeth it is a matter of great importance, that the stopping should be so placed as not to be visible. To accomplish this object, a small division should be made with a thin file, between the tooth affected and its adjoining neighbour in an oblique direction towards the posterior surface of the tooth, so as to obtain a regular and smooth surface, and also sufficient room to allow of the caries being perfectly extirpated, and the cavity filled with gold from behind the tooth.

Moreover, great care should be taken that as little as possible of the tooth be filed away from the sides, and that its natural form should be preserved. The advantages arising from these particular cautions are also of great importance. The teeth are stronger, the more lateral bony structure is preserved, and they will also endure a greater pressure in stopping them, so that the gold may be more firmly and more compactly fitted to the cavity, which also may thus admit of being made deeper, and better adapted for the reception of the gold; while the appearance, in the meantime, is not a little benefitted by the preservation of a more natural form of the tooth.

These objects are always attended with great difficulty, and the success of the operation greatly depends on the dexterity and skill of the dental surgeon.

For the extirpation of the caries, and the insertion of the gold into a cavity on the grinding surfaces of the molar teeth, the usual instruments for this operation will be found sufficient in very few instances only; and generally they will not suffice even in the most convenient cases, without the improved forms and modifications which I have given them. But when the cavity is situated upon any of the lateral parts or sides of the teeth, these instruments are wholly inadequate. The carious matter cannot be perfectly removed and consequently no cure of the disease can be effected. The gold cannot be properly inserted into the cavity, for if sufficient power be applied to press in the metal with the stopper as firmly as is necessary, it will inevitably loosen the tooth, or produce inflammation in the periosteum; and on the other hand, if, to avoid this effect, less than sufficient strength be applied in pressing in the metal, the loose plugging will be the cause of injury, from its allowing the introduction of foreign matter.

To avoid both these evils, it is necessary to be provided with instruments so contrived as to enable the operator to effect a counter pressure, proportional to that directly applied; so that whatever may be the force directed to one side, it is resisted by an adequate counter force on the other.

The inconveniences and difficulties attending this operation are so numerous, and of so various a nature, that it is quite impossible to give any particular description of them, or such directions as will meet every case. All that can be done is to establish some general principle for this difficult operation, and its execution must be left to the judgment and skill of the operating surgeon.

Sometimes the slightest difference in the situation or formation of the caries, or in the direction, situation or form of the tooth, is sufficient to produce great difficulty, and is found to require a great difference in the form and strength of the requisite apparatus. Should the decay for instance be situated, on the anterior side of one of the molar or bicuspid teeth, there will be no great difficulty in completing the operation after their division shall have been made; but if it be seated on the posterior surface, the difficulties arising from the situation are so great, that they appear quite insurmountable: yet they are never so in reality, and only require more dexterity and experience and a greater variety of instruments for their removal.

I have frequently stopped the *dentes sapientæ* in two or three different places; and, in a few instances, I have performed the operation on the posterior part of one of these teeth; indeed, in one instance, I filed and cut away the caries in two places, and extirpated the caries from five cavities, and plugged them with gold, in the same tooth, the particulars of which I beg to relate before I conclude this article.

CASE XLI.

Before I left the United States of America, I had occasion to examine the teeth of Mrs. B. of Philadelphia, who had been under my care seven years before. The caries had been filed and cut away from many of her teeth at that time, with a view to preserve them, and more than twenty cavities had been filled with gold.

The upper *cuspidati* had been both filed and stopped, and the lining membrane had been exposed and treated in the manner to be stated hereafter, previously to the introduction of the gold.

The lady had lost all her large grinders, the second large molars in the upper and under jaw on the right side, and the first on the under left side excepted. These molar teeth were become very precious in consequence of the loss of the others, and all of them were plugged in different places. The under second large grinder on the right side being rendered of the greatest importance by the above circumstances, was filed in two places, and had five cavities stopped with gold.

I had the gratification to find every tooth in complete order, and her whole mouth after the most minute examination, in perfect health. All the teeth were clean, white, and beautiful, none of the

stoppings in the front teeth were visible, except on a close and very particular inspection; the filed surfaces were perfectly white and sound, and the stoppings remained as firm and solid in their cavities as if they had been introduced on the same day.

For seven years no operation had been performed upon her teeth. The lady, however, had been constantly supplied with proper tooth powder and brushes, and with particular directions for their use, in order to preserve the perfect health and cleanliness of her mouth and teeth.

CHAPTER VII.

OF THE SURGICAL TREATMENT OF THE LINING MEMBRANE, OR NERVE OF THE TEETH, WHEN EXPOSED, PREVIOUS TO STOPPING THE CAVITY WITH GOLD.

By adopting the mode and principles stated in the foregoing chapter, for the operation of stopping carious teeth, it will frequently occur during the performance of the first or surgical part of the treatment that the nerve of the tooth, together with its accompanying artery and vein, is laid bare, and sometimes, also, that it is wounded.

In every case of complicated caries, when the disease has penetrated the whole bony structure of the affected side of the tooth, the exposure of the lining membrane is an unavoidable consequence, and necessary for the restoration of healthy action in this membrane, and for the permanent preservation of the diseased tooth.

It is not always possible to ascertain the exact stage of the disease, in consequence of the great variety of its symptoms and appearances; and the extent of it is, indeed, frequently not distinctly discovered until the necessary treatment has been, to a certain extent, completed.

If the caries has been left to itself, the symptoms of the disease generally proceed so regularly that the state of it may readily be detected by inspection; but in cases which have been aggravated by dental operations injudiciously performed, such as filing, cutting, or stopping, a diseased state is kept up, which may not unfrequently deceive both the patient and the dentist.

In most instances of this kind, the disease will be found to present a great variety of symptoms and appearances.

Stopping of the teeth in particular, when improperly performed, will be found frequently to operate as an accelerating cause of complicated caries, and will consequently be productive of effects

subversive of the intention of this operation; and the injudicious performance of the operation of filing or cutting, being calculated rather to excite than to remove the caries, is also frequently a cause of great injury; besides, it will often be found that the sound lateral parts of the bony structure, which are requisite for the reception of the metal in stopping, have been injudiciously cut or filed away; by which the exposure of the nerve is rendered unavoidable from the necessity of giving the cavity a sufficient depth for the reception and permanent retention of the gold.

The latter malpractice is of not less frequent occurrence than the former, and is more to be dreaded, because it is most frequently applied to such teeth as are most important. And I may justly assert, that in almost every case in which the operation has been performed upon those sides of the incisors, eye teeth, and small grinders, which are in contact with each other, I have had the mortification to see this useful operation abused in the above manner. See cases 7, 14, 42, and 44.

Every tooth affected in this way, either by disease or maltreatment, will be sooner or later inevitably destroyed, if not prevented by the treatment stated hereafter; and, if it presents sufficient indications for its preservation, every exertion should be made for that purpose.

This is, indeed, often an object of great importance. If, for instance, the incisors and cuspidati, or other teeth particularly necessary for appearance, pronunciation, or mastication, are affected with complicated caries; so long as their lining membrane is not yet in a state of suppuration, or deprived of its vitality, their preservation is almost invariably indicated; and should be preferred to such teeth as, although perfectly sound, possess not the same advantages.

In all cases where the exposure of the lining membrane of a tooth is owing to an unskilful manner of extirpating the carious matter, on the part of the dental operator, the patient's situation is truly deplorable; as the preservation of his teeth can be effected under these circumstances only by such treatment as requires particular judgment and skill.

Of the common method of treating the Nerve in an exposed state.

The remedies with which dental surgery had supplied us in these cases appeared to me at the commencement of my practice both cruel and contrary to reason.

All the authors I have yet been able to consult on this subject, from the time of Hippocrates down to the present age, unanimously concur in recommending, in these cases, the destruction of the nerve of the tooth and its investing membrane. They advise, for this purpose, the knife, concentrated acids, and especially the actual cautery.

I trust that in treating of caries I have sufficiently demonstrated the morbid effects of such destructive operations upon the other teeth, and the other parts of the mouth connected with the teeth, as also upon the general constitution.

The pain caused by the operation of destroying the nerve is so intense and protracted, and even the idea of it is so distressing, that few patients are willing to submit to this remedy. The bare consideration, however, of its producing very great pain and of its appearing very appalling to the patient, would not in itself be a sufficient ground for its rejection, if any hope of ultimate success could be entertained.

It ought to be the assiduous study, as it is certainly the most important duty of the humane dentist, to overcome these, like other difficulties, by calming the fears of the patient, and inspiring him with that confidence and submission which can be effected only by skill, gentle persuasion and tenderness; but there are other circumstances which render the adoption of this mode of treatment objectionable.

A tooth, which has been deprived of its vitality by the destruction of its nerve, acts upon the parts, with which it is in immediate contact, as a dead and foreign body. It produces all the evil effects which are usually the consequences of the dead root of a tooth but in a much greater degree.

From the moment a tooth is deprived of life, it becomes a useless and intrusive part of the animal economy, and causes an irritation with which the whole constitution sympathises. In the beginning, the suppuration at the root of a tooth exists in the fasciculus of the nerve and extends afterwards to the cord. The progress of the disease opens a way for the discharge of the matter through the canal of the root.

If, therefore, a tooth which has been treated after the above plan be filled up with metal, the natural opening for the discharge of the matter is thereby obstructed, and the pus, being confined and accumulated, works its way through the side of the socket, and produces a fistulous opening, by which the morbid effects of such a tooth are rendered much more extensive and complicated than the dead tooth that has been left to itself.

In the delicate and irritable subject, the violent irritation which is created by this unnatural operation in the whole nervous system, but more especially in the adjoining nerves and parts, frequently occasions an inflammation of the whole mouth, which soon concentrates upon the parts near the affected tooth, where tumefaction and suppuration take place. The pus being discharged from the swelled gums, the patient may obtain some relief, but a perfect cure is not accomplished. This can be effected only by the extraction of the tooth; an operation to which the patient soon flies for relief.

In strong and firm constitutions, however, when this operation of destroying the nerve is performed with neatness and dexterity, although these evil consequences occasionally appear, even with much violence and acuteness, yet they do not generally shew themselves at an early period.

In such cases, after the matter has been evacuated, the tumour disappears nearly altogether, leaving nothing behind it but a slight hardness. Through this small indurated spot, the matter, which usually collects at the point of the root, works its passage outward through the thinnest side of the socket, and is constantly discharged.

In addition to the irritation produced by the morbid state of the part upon the nervous system, and the constant discharge of pus, a portion of the matter, collected at the root, is absorbed, and, by irritating the glands, destroys the healthy secretions of the mouth which also act as a cause of irritation both upon the other teeth, and upon the stomach, and through this organ upon the whole system.

I have sometimes known a single tooth, which has been treated in this manner, become the cause of general disorder to the system and to all the other teeth in the mouth; of which the following case affords a striking example.

CASE XLII.

On the 22nd May, 1818, I was consulted by Mr. N. of Philadelphia, on the subject of his teeth. He informed me that about fourteen months previously, he had put himself under the care of a dentist, who, on cutting away the carious parts of the left cuspid, exposed the nerve of the tooth, which he immediately destroyed by the application of the actual cautery. The pain occasioned by this was so acute that the dentist could not, conformably to his original intention proceed to fill up the cavity with gold, but was obliged to defer this part of the operation and requested the patient to return to him again in five days.

A violent inflammation and swelling of the gums supervened, which prevented the completion of the operation at the time the patient was requested to return. He was directed to use emollient washes, &c. for his mouth, with a view to reduce the inflammation; but the swelling immediately around the tooth increased, and became highly painful; it soon, however, broke and discharged a considerable quantity of pus. The pain was now much mitigated, and the patient expected soon to be able to bear the operation of plugging his tooth. The swelling, however, did not wholly subside; the tooth was loose and extremely tender to the touch.

Four weeks after the nerve had been destroyed, it was still thought improper to proceed with the operation, and the patient was consoled by his dentist with the hope that the inflammation and swelling would not continue long, and that he would soon be in a proper state to have the operation finished.

In this hope, however, he was disappointed. The tooth remained extremely painful; the swelling of the gums increased, and again terminated in suppuration. After having thus suffered for about five months he became dissatisfied with his dentist, lost all confidence in the resources of art, and determined to rely for relief on the sanative efforts of nature.

Continued pain and distress soon obliged him to abandon this resolution, and again to apply to art for aid. Having now consulted me, I found his mouth in a most painful and diseased state. The eye tooth, whose nerve had been destroyed by the actual cautery, was loose, and so painful that the slightest pressure of the finger caused great pain to the patient. Its socket was greatly enlarged, and the inflammation had extended to the periosteum of all the sockets of the upper jaw, which were also enlarged in proportion to their proximity to the dead tooth. The parts were altered from their natural direction; so that the teeth adjoining the dead one had separated from it on either side, and, having been pushed forwards, the mouth was greatly disfigured.

The teeth that had been filed were again affected with caries, which was now proceeding more rapidly than before they were filed.

There was much tartar on all the teeth, but more especially on those which were dead, and those immediately adjoining. The gums were greatly inflamed, much swelled and spongy and upon the slightest pressure of the finger, they poured out a mixture of black blood and fœtid pus. The breath was very offensive; the face was pale and emaciated; although the constitution was naturally very healthy and strong.

The patient readily submitted to the plan of treatment I proposed to him; which consisted

1. In removing the inflammation of the bony structure of the jaw: this I effected in part by the removal of the irritating causes, viz. the dead tooth and the two diseased molares.

2. The removal of the inflammation and suppuration of the periosteum and gums. With this view, I carefully removed the tartar from the teeth, and directed the use of a mild stimulating wash for the mouth, and the subsequent careful cleansing of the teeth.

In three months afterwards, I found my patient sufficiently well to admit of my treating the individual disorders of his teeth with perfect safety; and by the other necessary operations on these, he

had the satisfaction of recovering not only the health of his teeth and mouth, but also that of the general system in a short time.

Of the author's method of treating the lining membrane of the tooth when exposed.

The judicious reader, I trust, will be convinced by what I have already said, of the impropriety of destroying the nerve of the tooth by any operation, and that it is a practice which ought to be altogether discarded from dental surgery.

I hope I may now be permitted to detail my own method of operating, in cases where the nerve of the tooth has become exposed, which I have practised for upwards of thirteen years, with much satisfaction and success.

The only rational mode of restoring to health, and of preserving such teeth as are suffering from complicated caries, in which the lining membrane has been exposed, is the restoration and preservation of the health and the life of this important part of the tooth. To obtain this object, after the removal of every other cause of symptomatic inflammation, whether of the hard or of the soft parts of the mouth, and of the structure of the teeth, has been accomplished in the manner and on the principles stated in the article on the general treatment of the diseases of the teeth &c. and, on the stopping of the teeth; I have adopted the following local treatment, which I have found to be the only one calculated to insure success, namely:

1. To put a stop to the caries, and consequently to prevent the irritation upon the internal membrane of the tooth.
2. To suppress the hæmorrhage, and to cure the wound of the membrane if it be wounded.
3. To protect the membrane artificially against the action of all foreign agents.

The first of these objects is to be obtained by the surgical preparation for stopping teeth, and as explained in the foregoing chapter. I need only add, that the extirpation of the caries should be performed with the utmost care, and with as little irritation to the nerve as possible; taking care also not to wound the membrane, if this can be avoided.

In performing this part of the operation, I have always been particularly careful to give the cavity the best possible form for the reception of the metal, and for its firm retention. I next wash it out with a little lock of cotton, fastened to a straight elastic probe, dipped in warm water. The cavity must be very carefully freed from small pieces, and even from the dust of bone that may adhere to its surface.

If the lining membrane is not wounded, I immediately plug the cavity with metal, and finish the operation in the manner to be mentioned hereafter.

But if the membrane should be wounded and the operation be followed by hæmorrhage, I resort to the treatment for the second indication, viz. to put an immediate stop to the bleeding, and to effect the healing of the wound.

For this purpose, I was, for sometime, at the commencement of my practice, in the habit of applying weak acids and styptica. These applications, however, did not often succeed. The former act destructively on the surrounding parts, and the latter could not be depended on in the operation. I therefore soon abandoned these means, and resorted to the actual cautery. By this application I effect an artificial contraction of the wound, and consequently a stoppage of the hæmorrhage.

I require for this the following apparatus: 1. A small iron wire, fastened to an ivory handle. The extremity of this wire I file to the size of the exposed surface of the nerve, and bend the wire in such a direction as to enable me to touch the exposed part of the membrane, without touching any other part of the tooth or the mouth. 2. A thick tallow candle, with a large wick.

I direct the patient to discharge all the saliva he may have in his mouth, and then to incline his head backwards against the head support of my operating chair. I put the candle into his left hand, and direct him to hold it in such a position that the flame of it may be on a level with his mouth, and about eight inches from it; I now place myself on the right side of the patient, and, holding his lips sufficiently open with my left hand, to prevent the instrument from touching them, I again dry the cavity as perfectly as possible with a lock of cotton fastened to the point of the cauterizing wire. Having effected this, I throw away the cotton from the extremity of the wire, and make it red hot in the flame of the candle. With the wire thus heated, I touch the exposed part very rapidly, so that its surface contracts, without, however, suffering it to penetrate deeply into the nerve, or to touch any part of the bony structure; as this would inevitably bring on suppuration and destruction of the whole lining membrane. The bleeding spot must be touched very quickly with the hot wire, which is sometimes necessary to be repeated two or three times before the parts are sufficiently contracted. The wire should be perfectly red hot, for in this state the cautery acts suddenly, and almost entirely without pain; but when heated to any temperature short of that of red heat, much pain and inflammation are generally produced. This operation is, indeed, so slightly painful, that I have been solicited by my patients to repeat it, although they had required much persuasion to induce them in the first instance to suffer its application. It, however, must be performed very adroitly, and without any loss of time. To prevent the flow of saliva to interfere, the patient must be desired not

to close his lips, but to keep his mouth wide open, until the whole of the operation is finished, which he is capable to do for a certain time only.

When the hæmorrhage has been arrested in this way, and an artificial cicatrix formed, I wash the cavity, as before the cauterization, with warm water. I carefully remove every particle of the ashes or matter that may have been left by the cauterization, taking great care not to wound the membrane again.

The nerve, which, before cauterization, had a fleshy appearance, is, after this operation, like a black point. I take care not to disturb this point, for if the black scar be removed, a new wound will be formed and bleeding again will ensue; but I leave the future healing altogether to nature, and only caution my patient against using such things as might interfere with its salutary operations.

Having thus far removed all possible cause of future disease and irritation, in order to prevent any unnecessary exposure of the nerve, by which inflammation and destruction of it might be produced, I now terminate the operation by fulfilling the third indication, that is, to protect the nerve against injurious impressions from without, by filling up the cavity of the tooth with metal. Having again perfectly dried the cavity, I now take a small plate of very thin lead leaf, and lay it upon the exposed nerve, and on the immediately surrounding bony parts. I next carefully fill up the whole cavity with gold. The dressing of the cavity and the firm insertion of the two different metals also, must be completed before the patient can be allowed to close his mouth which is not unfrequently very difficult.

In order that complete success may attend this operation, it is absolutely necessary that all its parts should be performed with the utmost degree of exactness and care, since the smallest error will inevitably cause a destruction of the life, and consequent loss of the tooth.

The whole operation, will prove abortive if the smallest particle of dead matter or inflamed bony substance is suffered to remain in the cavity. Such foreign dead matter left in contact with the living tooth, soon acquires corrosive qualities, and acts destructively upon the contiguous parts by irritating and inflaming them. The smallest quantity of blood left in the cavity soon becomes corrosive, and prevents the success of the operation. All kinds of moisture even must be removed, before introducing the metals, as the two contiguous metals might produce galvanic effects if there be an any intervening fluid and thus create a source of irritation and inflammation in the nerve.

When the cavity is once completely cleared of the loose particles of matter and made perfectly dry, the metal should be quickly in-

troduced, before the cavity becomes moist again from the natural exhalations in the mouth. The gold should of course be firmly and completely pressed into the cavity, in order to prevent the insinuation of any moisture after the operation.

In the whole of the performance of this operation the skill of the operator is of the highest importance; for if he has been successful in the difficult task of preserving the life of the nerve, the permanent preservation of the tooth depends equally on the skilful manner in which it is plugged with the two different metals, and the whole process is one of those by which one dentist may have an opportunity of proving his great superiority over another.

It may be asked why I cover the nerve with lead. I do so, because I believe this metal has a cooling and anti-inflammatory effect upon the irritated nerve of the tooth, at least it possesses these qualities in a greater degree than gold.

When, in the commencement of my practice, I employed gold exclusively, I was seldom successful in my labours, for inflammation, pain, &c. generally came on obliged me in a short time to remove the tooth entirely. I therefore resorted to the use of tin-foil as an experiment, and with this metal my success was more frequent though not what I desired it to be; for when the operation succeeded with this metal, it did not, from its great liability to corrode, remain long a protection to the nerve.

In all cases where tin foil is used, the tooth is preserved but for a few years, for the saliva is dissolving and uniting with the metal may act even more destructively than the disease itself.

On recollecting the cases so generally known of leaden bullets even when rough and battered, having remained for years imbedded in the flesh, I was naturally induced to resort to the use of lead in this operation. I do not recollect to have heard that a case has been reported of any other metal remaining in the body for a long period, without exciting inflammation and suppuration in the surrounding parts. My experience has ever since strengthened the opinion I drew from these facts, and I am now more confident than ever that this substance is less irritating to living parts than any other metal. I have used the lead under gold in the above manner for many years, and I feel myself justified in saying that nothing is so well qualified for this operation. The following case is a striking illustration of this fact.

CASE XLIII.

Mr. B. a gentleman of Philadelphia, of considerable chemical information, consulted me about the disordered state of his teeth, and requested my exertions to restore them to perfect health.

The under first large grinder on the right side had been previously stopped in such an improper manner as was calculated to

increase the progress of the caries towards the nerve of the tooth. In consequence of this the disease had advanced to a considerable extent.

1816, March 15.—By the perfect extirpation of the caries from this tooth an immense cavity was produced, and the lining membrane inevitably exposed in two different places. The tooth was stopped, agreeably to the method just stated, with tin foil: the operation was not completely successful as the tooth remained tender.

Some time after, this gentleman established a manufactory for gold beating, and giving him an order for some gold leaf, I requested he would also furnish me with some leaves of pure lead; which he soon delivered, and also desired to have the advantage of it in the case of his own tooth, alluded to above, which still remained irritable and tender.

1817, July 21st.—Agreeably to his request, the plug was removed, and the lining membrane was found in a state of considerable irritation. It closely adhered to the tin foil, and by the removal of the latter, a quantity of blood, amounting to four or five drops, was discharged. The hæmorrhage was arrested, and the tooth stopped again in the manner described, with the lead and gold. It was thereby preserved alive, and has continued free from pain, and useful ever since.

1824, August 24th.—Mr. B. visited London on some business, and requested my attendance for the restoration of any such defects in the state of his teeth, as might be the effect of his sea voyage. They were made perfectly clean, and the tooth which had been stopped was found in a state of complete health, and very useful.

After the above treatment, it is requisite to attend carefully to the following circumstances:

1st. The prevention of inflammation of the lining membrane or nerve of the tooth; and, 2dly, if inflammation has supervened, to endeavour to prevent its terminating in suppuration.

To answer the first object, the patient must guard himself from imprudent exposure to the damp and cold air, or to any sudden transition from heat to cold, or *vice versa*; he must also keep his teeth clean, by the use of some suitable dentifrice, good brushes, and warm water.

If the general diathesis of the patient's constitution be inflammatory, it may be useful to bathe his gums with a mixture of equal parts of tincture of myrrh and warm water, every three or four hours. When the tooth becomes painful, I scarify the gums, and promote the bleeding by warm fomentations. After the bleeding has ceased, the washing the mouth with the above mixture, with the addition of a little honey, may be continued.

If the inflammation be in the gums, and the pain become considerable, I have frequently directed the application of two or three leeches to the gums, but I have seldom seen any benefit arise from this practice; for, although the pain has generally subsided, the inflammation mostly ended in chronic suppuration, and the loss of vitality of the lining membrane. I have, therefore, abandoned this practice for many years, and have since only endeavoured to prevent any derangement in the *primæ viæ*, by requesting the individual to be attentive to the regularity of his diet. In most instances of this kind, however, the judicious application of some local stimulant, such as, the tincture of myrrh, camphor, or opium, has proved the most useful for this purpose.

The dentist must not suffer himself to be induced by the complaints of the patient to remove the tooth at once when he might desire it. In many instances the pain ceases with the operation; but sometimes the tooth becomes occasionally painful during several months. As long as it possesses vitality there are hopes of a perfect cure.

Should it, however, be loose, and of a pale and unnatural colour, the gums red, swelled, suppurating, and painful, with ulcers and fistulous opening in the neighbourhood of the tooth, then we may conclude that the nerve is destroyed, and that the operation has failed. In this case it is best to extract the tooth without delay.

If the tooth, after about three months has a natural and lively colour, and is free from pain without being insensible or loose, then the cure may be pronounced as complete. The tooth is now secured as long as the metal remains firm in its cavity, and protects the nerve against the action of external agents.

In almost every case where a course of different operations is necessary for a perfect restoration of the teeth, we find one diseased tooth, sometimes more, which would require this treatment, and these are, most frequently, amongst the most important, viz. the incisors, cuspid and bicuspid, and sometimes also the molar teeth.

On an average, five out of six teeth may be preserved alive, and rendered useful for a long space of time by the above treatment.

In conclusion, I beg to draw the particular attention of the reader to cases 7, 14, 16, 17, 18, 19, 21, 22, 23, and to relate the following case as an illustration of my practice on this subject.

CASE XLIV.

Mr. O. of Philadelphia, a very respectable gentleman, consulted me on the subject of his teeth, which had been injudiciously treated some years before. Many of them had been filed and the caries

cut away, and others stopped. All were in some degree covered with tartar; and many of them were in a state of rapid decay.

1817, November 12.—The teeth were rendered perfectly clean by scaling and cleaning.

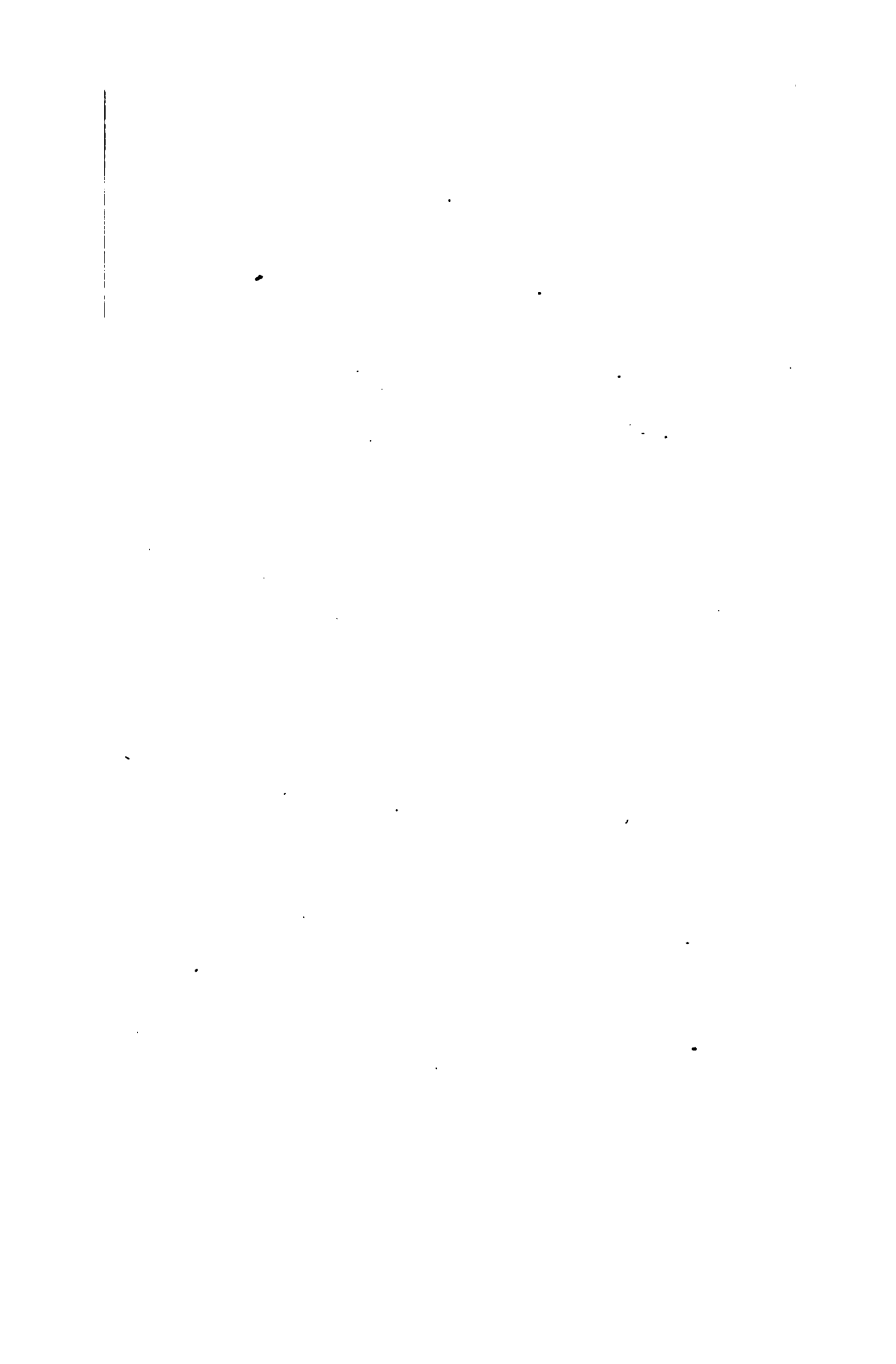
December 11.—Five teeth were again filed, the caries cut out from one of these, and the cavity plugged with gold. In the latter, the caries having penetrated into the cavity, the nerve was unavoidably exposed: it was, however, not wounded, and I treated it has been before directed.

1818, March 26.—Four teeth were filed, and four had the caries extirpated, and were stopped with gold. In all the latter, the caries having penetrated into the cavity, the nerve was unavoidably exposed: it was, however, wounded in only one of them, and treated as has been stated above.

July 6.—Two teeth were filed and two plugged. Both of the latter presented difficulties similar to those before mentioned; and in both, the nerves being exposed and wounded, the same treatment was required.

August 29.—One of the teeth thus preserved became rather painful, and a small tumour formed over the fang: as this tooth, from its situation, was of no great utility, I considered it best to remove it, gaining thereby a greater prospect of success in the treatment of the others.

Thus it will be seen that in this case, of seven teeth with exposed nerves, treated according to the method above described, six are now preserved alive, healthy, and useful; namely, one upper central incisor, one cuspid, two bicuspid, one under bicuspid, and one molar. I have the pleasure to add, that my patient has enjoyed excellent health for many years.



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